

GEOGRAPHY



CHAPTER 1

LET'S MAKE A MAP

Daulat's school re-opened in the month of July after summer holidays. Daulat was now in class 7. There were many new students in the class and they were happy to make new friends. The principal came to their class and told them that the strength of class 7 had increased that year, so there would be two sections - 7 A and 7 B, in separate classrooms. But there was only one room in the school for class 7. The principal said that one more room had to be built. The engineer had asked for a map of the school. The students had drawn a map of their classroom the previous year when they were in class 6. The principal now asked them to draw a map of the entire school. With the help of the map, the additional room could be planned and built as soon as possible. The children were very excited to know that they were to make a map of the entire school.

A few days later the class began to make the map of the school. "Last year, you had prepared a map of your classroom. Can anyone remember how the map was made?" the teacher asked.

"We had first identified the directions - the north, the east, etc." Daulat replied. "Then we made a list of immovable objects so that



they could be shown on the map. We even decided on symbols for each object," Jodha added.

Pura said, "We measured the whole classroom with a ruler and decided that one matchstick would correspond to the length of one ruler." Daulat said, "Yes, the northern wall of the room was six rulers long, so we showed it by joining six matchsticks in a line. Once the walls of the classroom had been shown we filled in the rest of the things with symbols. This is how we drew the map of our classroom."

The teacher said, "You are right. Now fill in the blanks, so that you remember all these."

- *Towards the upper margin of the map is the direction; towards the lower margin is the direction; towards the right side is the direction; and towards the left side is the direction.*
- *All the objects are shown on the map, as they are located on the*
- *Maps are made as if we were looking at the ground from the*

The teacher said, "Now we have to draw a map of our whole school, so that the engineer can decide where the new room can be built. Moreover, she will want a map with exact measurements. Last year, all of you learnt how to measure distances. A variety of things were measured in units of meters and centimeters. The present map, too, has to be measured in meters and centimeters, so that the engineer will be able to understand it."

Pura asked, "Why, Madam? Why will the engineer have trouble with our scale of one matchstick corresponding to one ruler? If we

tell her that the wall is eight rulers long and that we have shown it with eight matchsticks, why will she not be able to understand it?"

The teacher replied, "She might find it difficult to understand. How do we know what sort of ruler she has? Maybe her ruler is one meter long, or half a meter, or one foot long. It is also possible that the matchsticks she has are longer or shorter than ours. So how will your measurements be the same as hers?"

Children Draw a Map

All the children in Daulat's class began drawing a map of their school. Like them, you too, can draw a map of your school.

1. First, identify the directions. If necessary, use a magnetic compass to find the directions.
2. Go around the school and note the surroundings, classrooms, corridors, etc. and make a rough sketch of the school. Remember that the northern wall should align with the upper margin of the page.
3. Now make groups of four students each. Two students of each group will measure the length of the walls and the other two will note the corresponding distance on the sketch. In this manner every student will be able to check the work of the others and correct any mistake.

- *Look at the sketch of Daulat's school and the measurements recorded and answer these questions:*
 - *How many meters wide is the corridor of Daulat's school?*
 - *How many meters long is the southern wall of Daulat's school?*
 - *How many meters long is the western wall of class 6?*

So here we have the sketch or the rough map of the school. Now we have to draw it to scale.

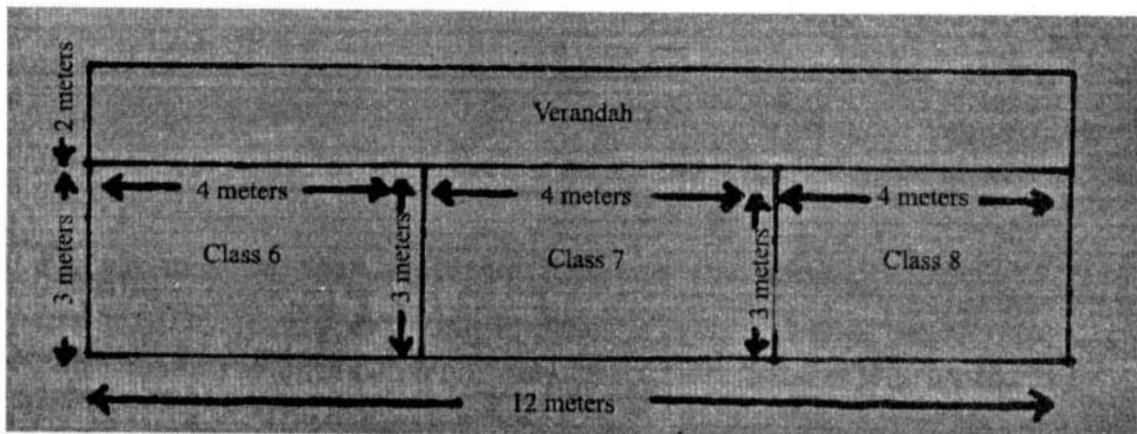
Scale

The teacher said, "How can we draw the map of such a big school on a small piece of paper? We don't have so much space. So, to show a big object on a small paper we have to use a scale.

"When we drew the map of the classroom in class 6 we had assumed that the actual distance of one ruler corresponded to the length of one matchstick on paper. If a wall measured six rulers we showed it in our map with the length of six matchsticks.

"In this way we used a scale to show a big object in a smaller scale on a map. We have now measured the length and breadth of our school in units of the meter. We have to depict

Fig. 1 Sketch -map of the school





this on paper in a smaller size. We will show one meter by one centimeter. The southern wall of our school is fifteen meters long, so we will show it with a fifteen-centimeter long line. Therefore our scale is: 1 centimeter = 1 meter."

- With the help of this scale draw lines for the following lengths: 2 meters, 5.5 meters, 9 meters.

- You can draw a map of your school according to this scale. First draw the outer walls and then the walls between the corridor and the classrooms.
- Now that the outline of the school is ready, show the doors. The doors have to be shown with symbols in the correct position and in the correct direction.

- Make an index of symbols beside the map so that readers can understand your symbols. Also write the scale of your map and make an arrow pointing to the north.

After the map was made the teacher said, "Now show what is all around your school with the help of different symbols. For instance, there is a well to the east of the school, so show it with an appropriate symbol. In this way fill the map with objects in all four directions."

Once the map of Daulat's school was ready, the principal sent it to the engineer.

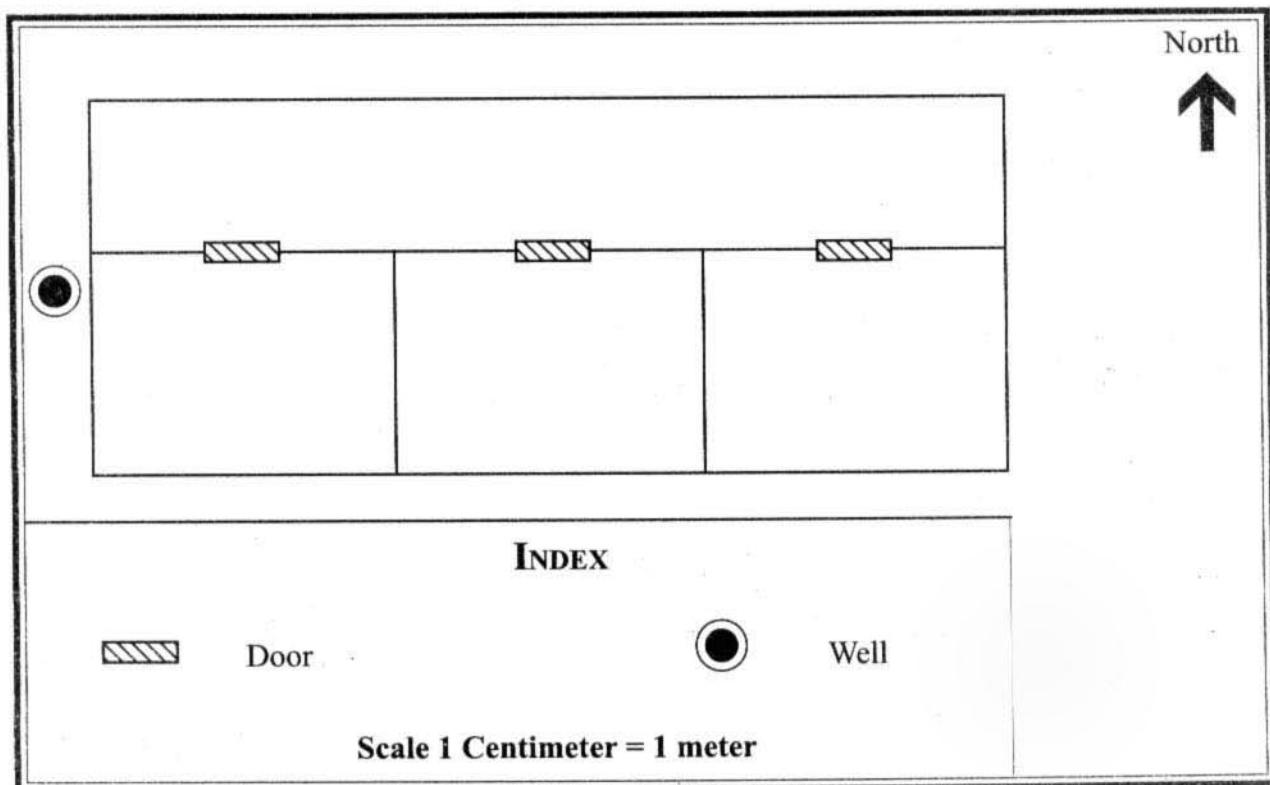
- Look at the map of Daulat's school and answer:

What is to the west of the school?

In which direction of the school can the second room for class 7 be built?

You too can fill in the objects on all sides of your school on your map, with symbols. In this way the map of your school will be ready.

MAP OF DAULAT'S SCHOOL



EXERCISES

1. What are the four main characteristics of a map?
2. What are the different methods of identifying directions?
3. Why is it necessary to prepare a sketch of the school before making a map? Did you find it useful?
4. Why is it necessary to draw the map to a scale?
5. A map was made according to the scale 1 centimeter = 1 meter. The length of the rooms and corridors in the map were as follows:

The length of the room was 4 centimeters, breadth of the room was 6.5 centimeters, and the length of the corridor was 8 centimeters. Can you give the actual lengths in meters?

Length on the map	Actual length
4 centimeters	
6.5 centimeters	
8 centimeters	

6. Look at the scale of the map on page 6. Using this scale, measure in centimeters the distances between the following places and convert them into kilometers:

1. Jaipur to Lucknow centimeters.....kilometers.
2. Kolkata to Srinagar centimeters.....kilometers.
3. Bangalore to Shimla centimeters.....kilometers.
4. Delhi to Kolkata centimeters.....kilometers.
5. Chennai to Kohima centimeters.....kilometers

MAP 1

MAP OF INDIA



An interesting exercise: This map contains just the capitals of all the states. Look at the map on page 144 and write down the names of all the states and colour them.

CHAPTER 2

LANDS HIGH AND LOW

Jodha lives in Nimpur, which is situated near the seashore and at the foot of a hill. One day Jodha and her friends wanted to visit a temple nearby. Their teacher said, "You will have to climb to a height of 50 meters to reach the temple on the hill. If you were to climb another 50 meters high you will reach the top of the hill." Jodha and her friends set out and walked on a zigzag path for nearly half a kilometer to reach the temple. Sometimes the climb was gentle and sometimes, very steep.

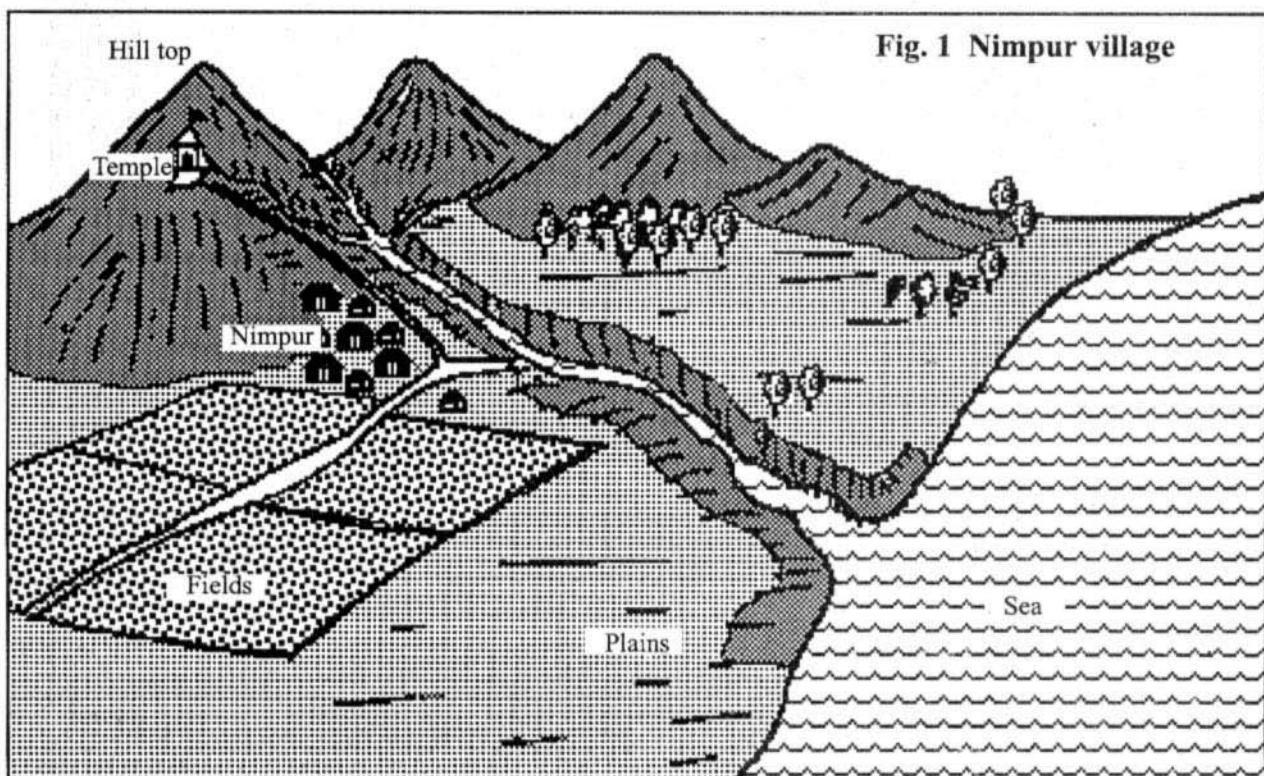
They could see the surrounding country, the streams, fields, village, forests, etc. from the temple. Then someone suggested, "Let us climb up to the top of the hill. We will get a better view." Everyone agreed even though they were tired and they set out to climb. Once again they had to walk for about half a kilometer to reach the top of the hill.

Jodha and her friends could see even

farther from the top of the hill. Now they could see the blue sea - stretching for miles. From the hill it looked flat, without ups and downs, unlike the land with its hills and valleys and plain fields. The sea was certainly lower than the rest of the land for they could see the river winding its way to join the sea. Just then one of the friends wondered, "There is so much water in the sea and our village is so near it. It may even flood our village sometime!" They were worried at the thought. They wished they had teacher with them to seek an explanation.

The next day they remembered to ask their teacher whether the sea could flood their village. "No, the sea will never flood our village for our village is 50 meters higher than the sea level. It is true that during storms and high tides the low lying lands get submerged, but our village is situated at a height. So there is no such danger" the teacher answered.

Fig. 1 Nimpur village



- What was the distance between Nimpur and the top of the hill?
- How many meters high did Jodha and her friends have to climb from their village to reach the top of the hill?

Jodha was keen to know how they could find out the heights of different places. The teacher agreed to show them maps, which showed the heights of different places and also to teach them how to read those maps.

Sea Level

"Usually we measure all heights from the level of the sea surface" said the teacher as she began the lesson. "If you fill water in a bucket or if you see the water in a pond you will notice that the surface of the water is even, without any ups and downs. In the same way the level of seawater across the entire world, too, is even. This is because all the major seas and oceans are linked and the water of one flows into the other, maintaining a level. Land is higher than the sea level and hence all heights on land are measured from the sea level. In other words, the world over we assume the height of the sea surface to be '0' meter. This is also known as the *sea level*."

- An activity

Make a model of Nimpur village and the nearby hill as given in figure 2. You can use clay, sand, small plants, etc. to make this model. Also make the sea by filling a depression or a plate with water. Show the village and the temple too.

- What of figure 1 has been shown in figure 2?

- Look at figure 2 and fill in the blanks in the following sentences:

Nimpur is meters above the sea level.

The temple is meters above the sea level.

The hill top is meters above the sea level.

What has been taken as the height of the sea surface?

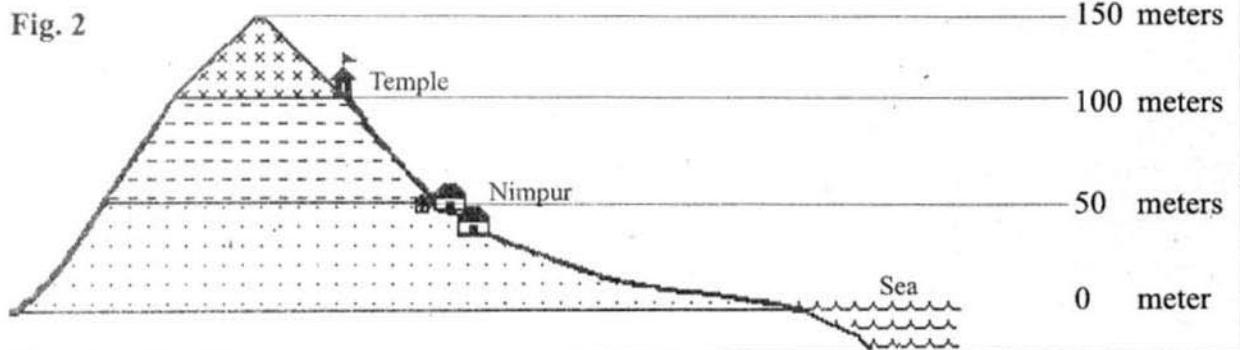
Jodha's village was near the sea and hence it was possible to tell the height from sea level easily. How can we find out about the heights of places far away from the sea?

Today the heights of all places have been calculated with the help of sophisticated instruments and shown on special kind of maps. If you can learn to read heights on these maps you will have little difficulty in finding out the height of any place.

Maps Showing Heights

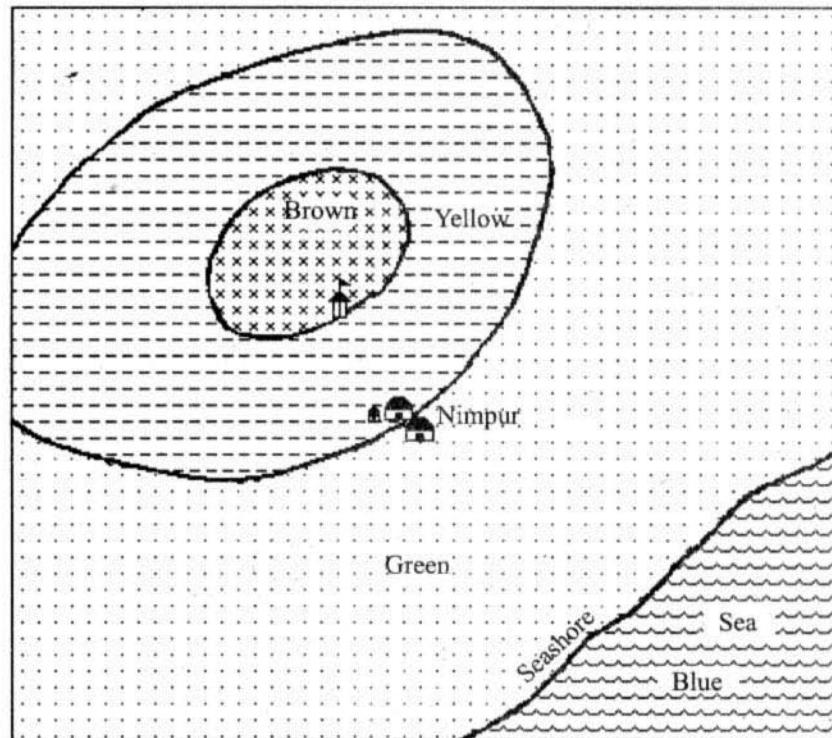
Look at map 1 carefully. This is a map of the area around Nimpur. Land which is upto 50 meters above the sea level is shown with the following symbol [■]. The height of the area between the village and the temple is above 50 meters and less than 100 meters. This height is shown with the symbol [■■]. The height of the area between the temple and the hill-top is

Fig. 2



Map 1

Map of Nimpur Showing Heights



Index



100 to 150 meters



50 to 100 meters



0 to 50 meters

between 100 and 150 meters and this is shown with the symbol .

- *Which place is 0 meter high?*
- *In which zone will you find a spot 30 meters high?*
- *In which zone will you find a spot 125 meters high?*
- *In which zone will you find a spot 75 meters high?*

You have read in class 6 that we show all places on the map as if we were viewing the earth from above. Look at the model of Nimpur village you have built from above. Does it look like map 1?

- *Do you think that if we were to look at the village of Jodha and the nearby area from the sky, it would look like the map?*
- *Now colour the different height zones in different colours as suggested in the map. This will help you distinguish the zones easily.*

An Exercise

Some people think that the portion shown near the lower margin in any map is actually of lower height and the land shown near the top will be higher. This may not necessarily be true. Look at Map 2.

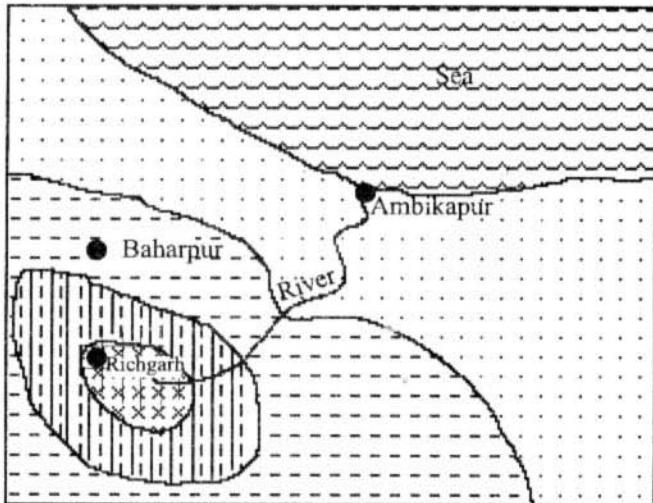
- *Is the low land in map 2 situated at the bottom of the map or at the top?*
- *Which is the highest town?*
- *Where does the river start? Show the direction of its flow with an arrow.*

In order to know about the heights in a map one must look at the key or index carefully.

Colours in a Map

Hang a wall map of the physical features of India in the class.

- *What is the height of the sea surface in this map? By what colour is the sea shown in this map?*



MAP 2

Index

	500 to 700 meters
	300 to 500 meters
	100 to 300 meters
	0 to 100 meters

- How many colours are shown in the index? What height does the colour green indicate?

Uses of Maps Showing Heights

When reading about a country or a region we often need to know about the mountains, plains and plateaus there. It is possible to recognise these regions in a map showing heights (also called physical maps).

If you were to look at the physical map of Madhya Pradesh, you would see that the Vindhya and Satpura ranges stretch from the east to the west of the state. In between the two ranges are the plains of the Narmada valley. North of the Vindhya is a vast plateau also

called the Malwa plateau and the Satna-Rewa plateau. There is another plateau south of the Satpuras called the Deccan plateau.

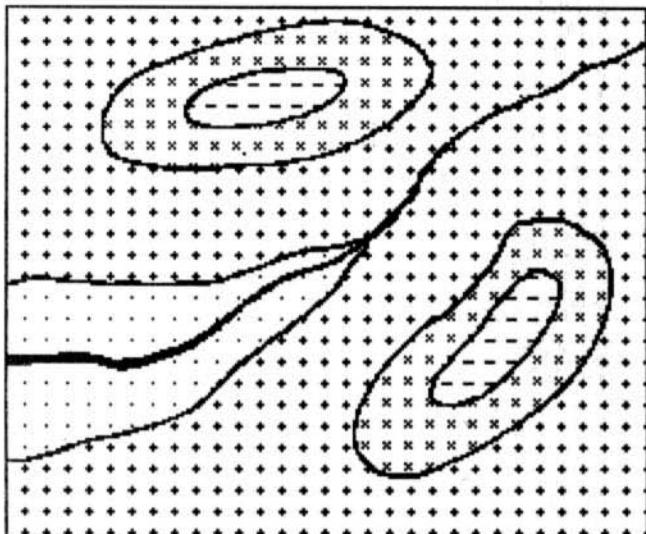
- Look for all these features in a physical map of Madhya Pradesh. Can you recognise them with the help of colours?

Maps showing heights are very essential when roads or dams have to be constructed. If we have to lay roads in an undulating region between two places such maps help us in deciding the route to be taken by the road. Similarly, when a dam is planned it is necessary to know how much land will be submerged by the waters of the dam. This again can be found out with the help of maps showing heights.

Map 3

Index

40 to 50 meters	
30 to 40 meters	
20 to 30 meters	
0 to 20 meters	



• Look at map 1 and tell whether Nimpur will be submerged if sea waters were to flood upto 30 meters?

• Look at map 3 and answer the following questions.:

Mark the direction of flow of the river.

The height of the lowest land is between meters and meters.

There are two high points in this map. What is their height?

Colour the lowest portion in light green, the next higher portion in dark green, still higher portion in yellow and the highest portion in brown.

MEAN SEA LEVEL (MSL)

In every railway station, the yellow board showing its name also shows the height of the station. It will be shown as so many meters above the 'msl' or mean sea level. What is this 'mean sea level'? You may know that there are high tides and low tides on the sea and the sea is never still. As a result the level of the sea keeps rising or falling. Which of these heights do we take as the sea level or 0 meter height? In order to solve this problem the level of the sea is carefully measured at frequent intervals and the mean level of the sea is calculated on its basis. This is called 'average sea level'. This calculation for India is done in Chennai. All heights in India are calculated from this height in Chennai.

EXERCISES

1. Look at the physical map of Madhya Pradesh and find out what height each colour indicates. Then look at the map and answer these questions:
 - i. Near which rivers are regions with the height of 300 meters found?
 - ii. a. The height of regions shown in yellow colour is meters.
b. Write the name of at least two towns in this region.
 - iii. a. The height of the highest region of Madhya Pradesh is between meters and meters.
b. Write the names of two places in this region.
2. Which towns are shown at the height between 800 meters and 1200 meters in the map of India? Which is the highest region of India? What colour has been used to show this region?
3. a. Can you recognise the plains of the Ganga in the physical map of India?
b. What is the height of the plain stretching from Kolkata to Allahabad?

CHAPTER 3

RAINFALL AND RIVERS

After the unbearable heat of April, May and June, comes the rainy season which lasts for a few months. Do you know what causes the rains? Where do the rain bearing clouds come from? Discuss whatever you know or think about these things in the class.

EVAPORATION

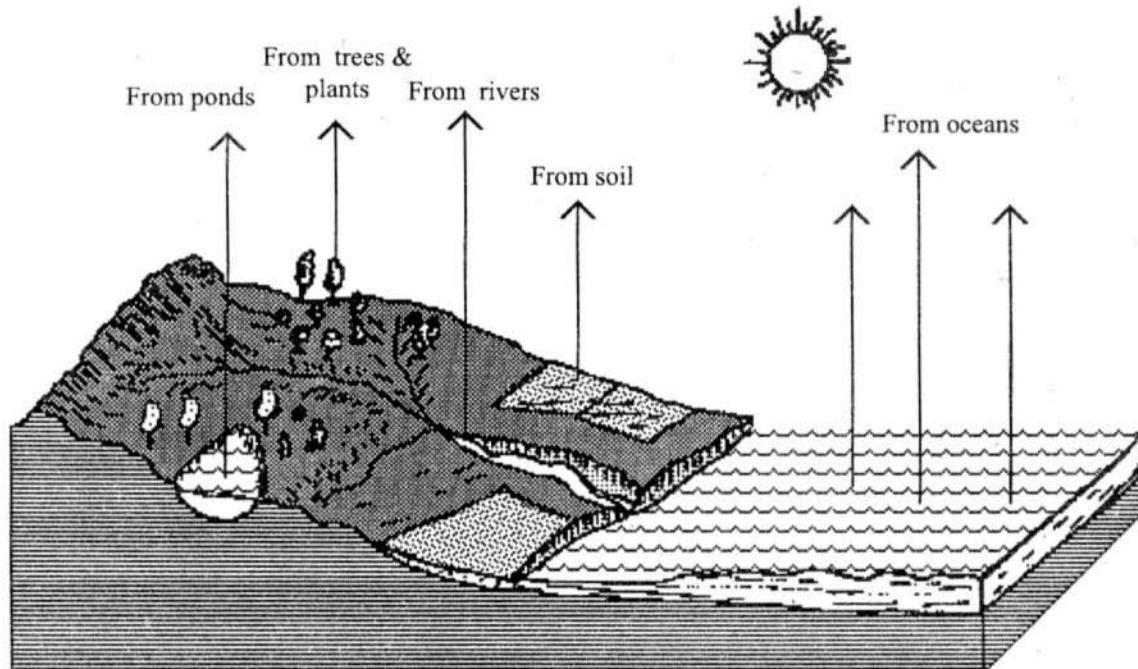
The story of rain begins with water vapour. What is water vapour? When you dry your wet clothes in the open, you see that the water disappears after a while and the clothes dry. Similarly, if you keep some water in a plate it dries up in a couple of days. Actually, water in the cloth or in the plate becomes water vapour and mixes with the air through a process called 'evaporation'.

There are several water bodies on the earth's surface - oceans, rivers, lakes, etc. There is constant evaporation of water from these

water bodies. In fact, wherever there is moisture there is evaporation. There is evaporation from our bodies, from trees, plants and soil! The process of evaporation speeds up with increase in temperature.

- *Look at figure 1 and make a list of all the things from which evaporation takes place.*
- *Do you think there is more evaporation during the day or the night?*
- *In which season do you think there would be more evaporation – in summer or winter?*

Fig.1 Evaporation



- Where do you think maximum evaporation would take place— from plants, rivers, oceans or soils?

FORMATION OF CLOUDS AND RAIN

When water vapour rises with hot air and reaches high up in the sky, it gets cooled. This is because it gets cooler as we rise above the surface of the earth. With the cooling, water vapour is transformed into tiny water droplets. These droplets gather around minute dust or smoke particles in the air and gradually increase in size. These small drops of water gather to form the clouds.

- Make a diagram to explain how vapour is transformed into a cloud in the box given below. Label your diagram with these terms – earth, sky, rising vapour, cold, dust particles, water droplets, clouds...

- Make a diagram to explain this process in the box above.
- Why do you think it is necessary for the clouds to rise in order to cause rain?

WINDS & CLOUDS

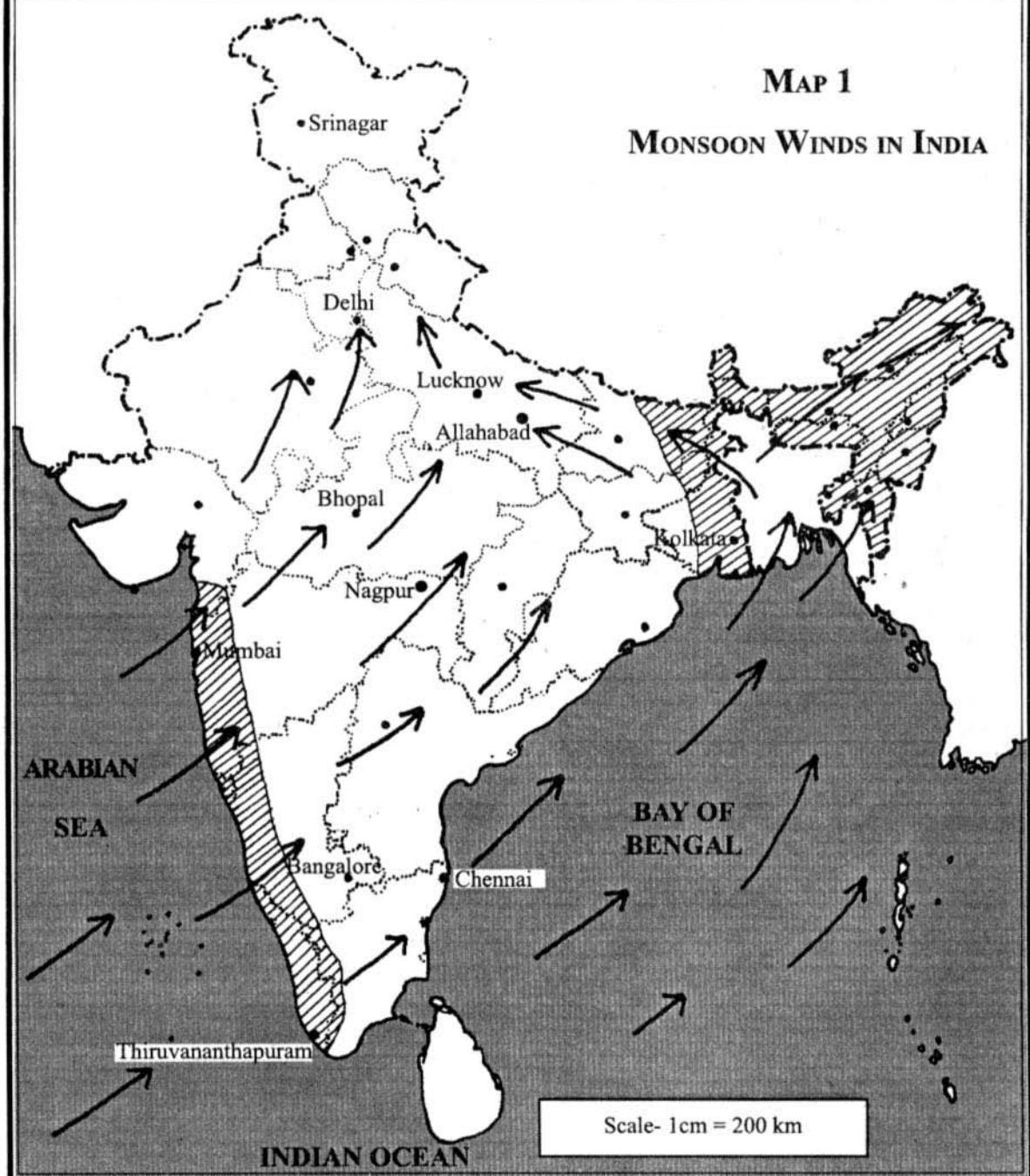
Since evaporation takes place all over the earth's surface, clouds are also being formed all over. However, it is on the surface of the oceans that maximum evaporation and cloud formation takes place. After all, oceans are vast water bodies extending upto thousands of kilometers. As a result it also rains very heavily on the oceans. Clouds also travel inland for thousands of kilometers to bring rain to us. Do you know what brings them deep inland?

- From which direction does the wind blow during the rainy season?

As the cloud continues to rise upwards, it gets cooler and more droplets are formed. The droplets get together to form bigger drops. As they get heavier it gets more and more difficult for them to remain in the air and so they begin to fall as rain.

These winds come all the way from the Arabian Sea and the Bay of Bengal and they transport the rain clouds. They are called 'Monsoon winds'. They are also called 'South-West Monsoon winds' as they blow from that direction. These winds blow only in the summer.

MAP 1
MONSOON WINDS IN INDIA



Based upon Survey of India Outline map printed in 1987. The territorial waters of India extend into the sea to a distance of 12 nautical miles measured from the appropriate baseline. © Govt of India copyright.

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Areas of Heavy Rainfall



Wind Direction

There are two arms of the monsoon winds: one blows from the Arabian Sea and the other from the Bay of Bengal. The arrows in Map 1 show us the direction of these winds.

- *Towards which parts of the country will the winds take the clouds being formed in the Bay of Bengal?*
- *Towards which parts of the country will the winds take the clouds being formed in the Arabian Sea?*
- *From which direction will the winds blow to bring monsoon rains to West Bengal, Lucknow and Delhi?*
- *From which direction will the winds blow to bring monsoon rains to Mumbai, Nagpur and Bhopal?*

These are the two branches of the monsoon. The winds blowing from southwestern side bring rainfall to Madhya Pradesh and the winds blowing from the east bring rainfall to the Gangetic valley (states of UP, Bihar and West Bengal).

Why Does It Not Rain Equally Everywhere

You may know that different parts of the country receive different amounts of rainfall. Places like Kolkata and Mumbai receive very high rainfall, while places like Delhi and Jaipur get less rain.

The clouds that rise from the Bay of Bengal and Arabian Sea reach the coastal areas like Mumbai and Kolkata first. These clouds are dense and hence it rains heavily on the coasts. When the winds carrying the clouds move towards the interior parts, rainfall decreases as the clouds begin to lose moisture. By the time they reach Rajasthan, there is very little moisture left in the winds. Therefore, this state receives very little rainfall and remains dry most of the time. Similarly, the winds blowing from the Arabian Sea result in plenty of rainfall on the western coast. By the time their winds reach states like Tamil Nadu and

Andhra Pradesh on the eastern side, their moisture content becomes less and therefore rainfall decreases. That is the reason why the coastal parts of these states receive less rainfall compared to the coastal areas of Kerala, Karnataka and Maharashtra.

The winds that blow from the Bay of Bengal cross the coast near Kolkata and reach the Himalayas. They are forced to rise upwards along the mountains. This cools the moist air further, and there is plenty of rainfall. This is the reason why, besides the eastern part of India, countries like Bangladesh, Bhutan and Nepal receive plenty of rainfall. On the other hand, western Himalayas receive much less rainfall.

- *Look at the map and answer these questions:*

Do you think there will be more rain in the western part of Rajasthan than in the eastern part?

Do you think it will rain more in Thiruvananthapuram or in Chennai?

Do you think it will rain more in Uttarakhand or in Sikkim?

Besides Rajasthan, where else do you think deserts can be found in India?

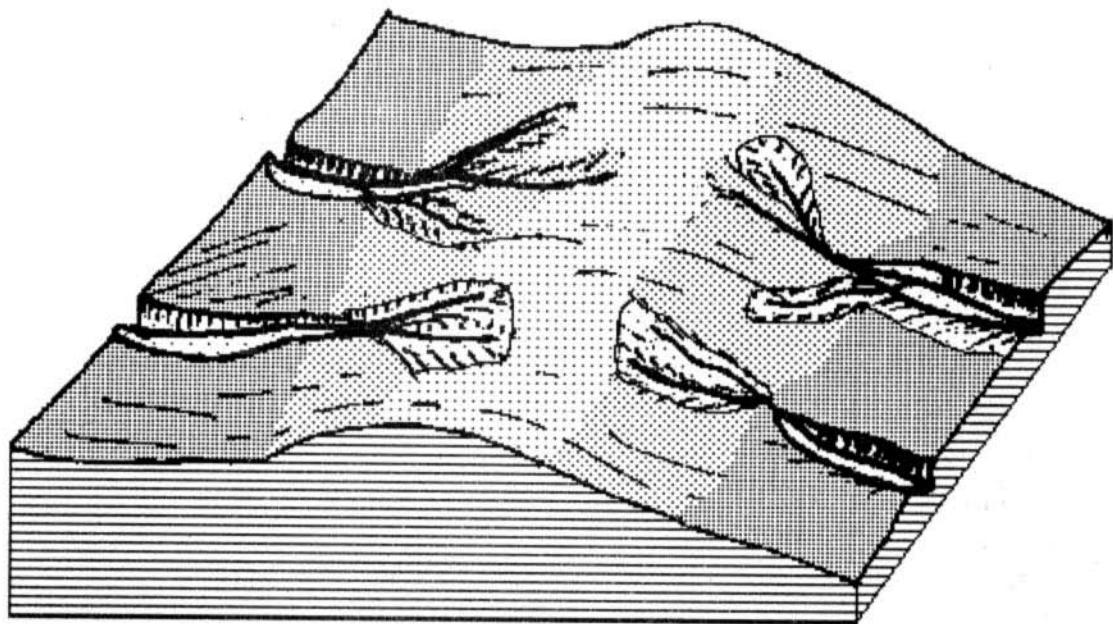
WHERE DOES THE RAIN WATER GO?

What happens to the water that falls on the earth? Some of it percolates into the soil, some flows on the surface of the land and the rest becomes water vapour and mixes with air. You will read about the water that percolates down into the soil in the following chapter. In this chapter we will discuss the water which flows on the surface of the land.

Rivers

Have you seen rain water flow in small streamlets on sloping land? In the same way, water flows in small streams from mountain slopes during the rainy season. However, these streams dry up after some time. Nevertheless,

Fig. 2 Slopes and the Formation of Rivers



the water cuts channels on the mountains. When it rains again, water flows down the same channels. In this way river courses and river valleys are formed. This process is shown in figure 2.

- *Study this figure and answer these questions:*

Mark the direction of the flow of the river with arrows.

Mark the direction of the slope of the land with arrows.

Do the rivers flow in the same direction as the slope of the land?

large rivers like the Betwa, the Kali Sindh, the Chambal, etc. If you visit Amarkantak, in Shahdol district, you will see the source of the Narmada. The Narmada is very thin here. When it flows further it is joined by several streams and becomes a big river. Its valley broadens and deepens. The river Narmada in Jabalpur and Hoshangabad is very broad and deep.

- *Can you name the tributaries of the Narmada by looking at Map No. 2?*

The Rivers of Madhya Pradesh

There are two major hill ranges in our state, the Vindhya and the Satpuras. Most of the rivers of Madhya Pradesh begin from these hills.

- *Look at the map of rivers of MP and make a list of the rivers beginning from the two ranges:*

Vindhya	Satpura

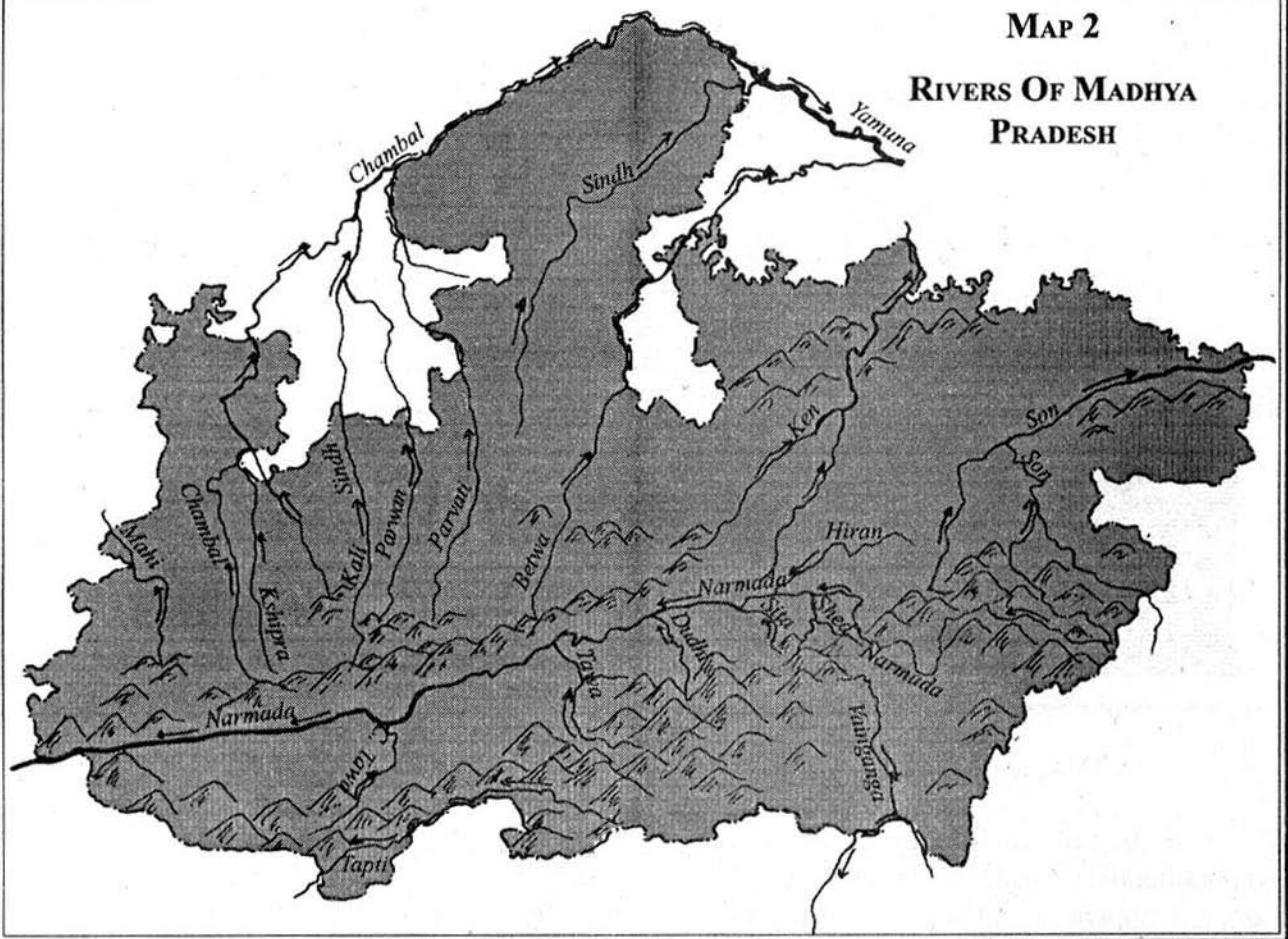
Transformation of a Stream into a Broad River

At its source, a river is usually in the form of a thin stream. As it flows further it gets bigger and broader. This happens because many small streams join it as the stream flows. Rivers or streams, which join a larger river, are called 'tributaries'. As the amount of water in the main river increases, it becomes bigger and broader.

If you travel in the Vindhyan ranges you will see several small streams combine to form

MAP 2

RIVERS OF MADHYA PRADESH



1 Direction of flow

- List the rivers flowing northwards.
- Can you name two rivers, which have their sources very near to each other but flow in almost opposite directions? Why do you think they flow in opposite directions?

As you know the direction of flow of a river is determined by the direction of slope of the land. This means that the slope of the Narmada valley is from the east to the west, whereas the slope of the region drained by the Betwa is from the south to the north. The direction in which a river is seen flowing will indicate the slope of the region through which it is flowing. If you stand by a river, you would know in which direction it is flowing and the

slope of the region through which it is flowing.

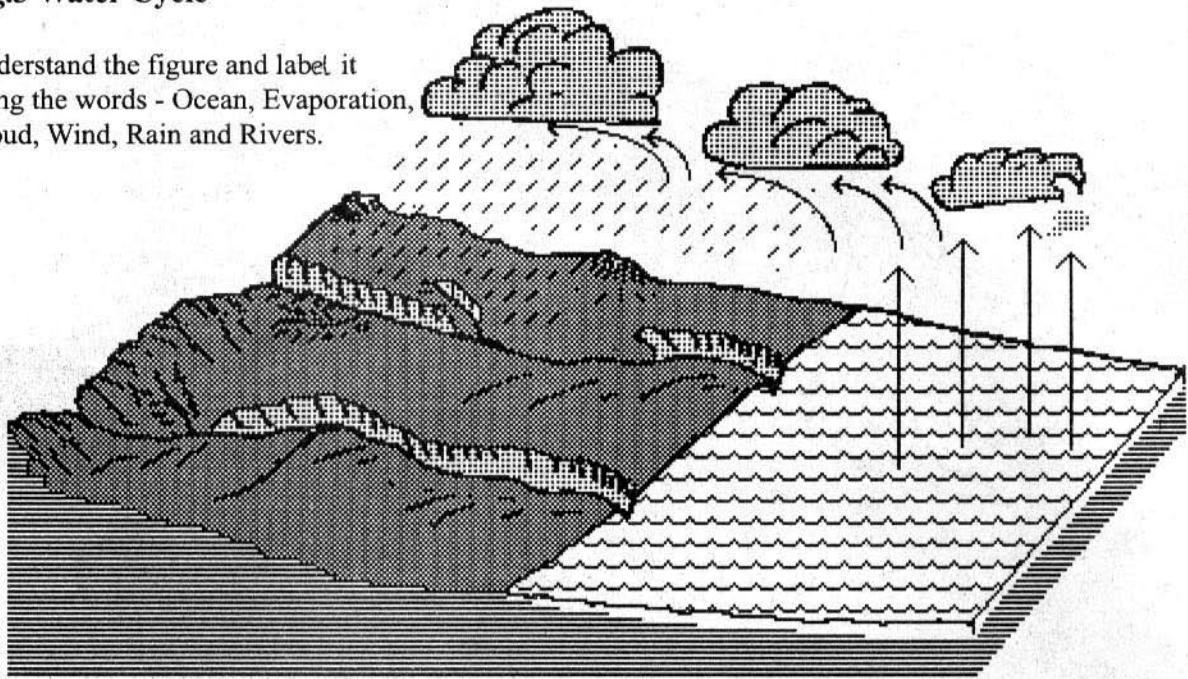
- By looking at the map can you tell whether the entire Madhya Pradesh slopes in one direction? Can you discern the different directions of slope in the state?

All rivers flow along the slope to eventually meet the sea. If you look at the map, you will see that the Narmada crosses the state to enter Gujarat and finally flows into the Arabian Sea. The point where the river meets the sea is called the '*mouth of the river*'.

- Look at a map of India and find out which rivers do the Chambal and the Son join. Also find out if they too eventually meet the Arabian Sea.

Fig.3 Water Cycle

Understand the figure and label it using the words - Ocean, Evaporation, Cloud, Wind, Rain and Rivers.



WATER CYCLE

We began the story with water evaporating from the seas and oceans. Now the story is complete with the rivers meeting the sea. This cycle of water evaporating from the seas, becoming clouds in the sky, pouring down as rain and flowing down the slope on the land in the form of rivers and finally joining the sea again is called the *Water Cycle*. Figure 3 sums up the cycle. Study it carefully.

- *Can you write in your own words, the history of a drop of water, which reaches the mouth of the Narmada after completing the water cycle?*

DROUGHT

You know that the rainfall is not the same every year- it may rain heavily one year and very little the next. If the rainfall is less than one fourth of the normal yearly rainfall it is said that a *drought* has occurred. If it does not rain enough for a few years, the ponds, lakes, wells, etc. dry up. Due to water shortage, crops

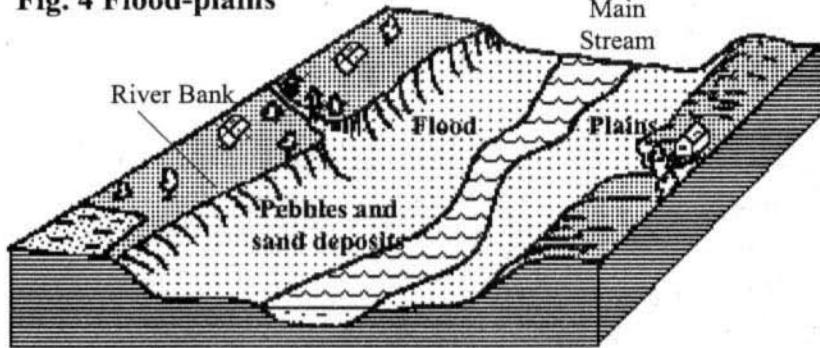
also fail, resulting in a decline in agricultural production.

- *Discuss the impact of drought on the following:*
 - drinking water:*
 - fodder for animals:*
 - crops:*
 - forests:*
 - rivers:*
 - wells:*
- *Have a discussion in the class about how people cope with droughts.*

FLOOD-PLAINS AND FLOODS

A river does not contain the same amount of water all the year round. While the river is full during the rainy season, it usually shrinks during the dry season. Look at figure 4. You can see that the river trough is very wide and it has high banks. This trough is filled with sand and gravel. The river flows as a small stream

Fig. 4 Flood-plains



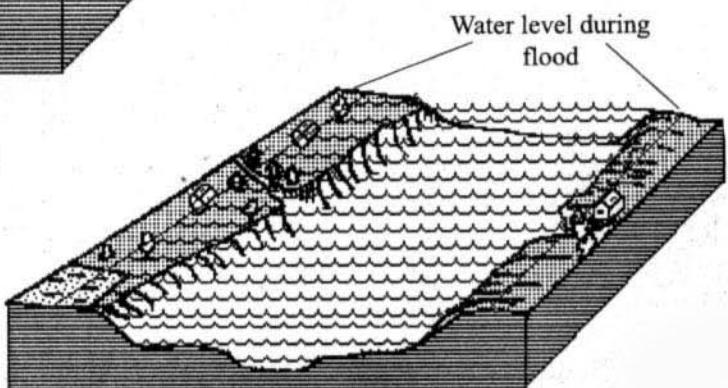
amidst them. You will notice that there are no trees here. This is because every year when it rains heavily, this trough is filled with water allowing no permanent tree or plant to grow here. This treeless bed is called the *flood-plain* of the river. All major rivers have their flood-plains.

You must have often heard that during the rainy season some parts of the country get flooded due to excessive rainfall. You may have read about floods occurring in rivers like the Narmada, the Brahmaputra or the Ganga.

- *Figure 5 depicts a flood situation. Look at it carefully and answer the following questions.*
- *Has the river water covered the entire flood-plain or is it confined to the tiny stream that was flowing in the dry season?*
- *Is the water confined to the flood-plain or has it overflowed the banks of the river?*
- *In what way have the floods affected the villages, agricultural fields and trees?*
- *Floods are also beneficial to agricultural fields – can you find out how floods help?*

Floods have become a major problem in our country in recent years. Some part of the country or the other is flooded every year during the rainy season, causing severe damage to people, crops and livestock. Let us find out if we have contributed to this in any way.

Fig. 5 Flood



Vegetation cover on the land (trees, plants, grasses, etc.) obstructs the run off of rainwater and slows down the speed of its flow. This slowing down helps the rainwater to percolate into the soil. Vegetation cover also prevents rainwater from flowing fast over the soil. Floods are often caused by sudden increase in the volume of water reaching a river. Vegetation allows the water to flow slowly to the river, thus preventing sudden flooding. It also helps to increase the amount of water, which goes into the soil. This reduces the total amount of water that flows into the river.

Vegetation also helps to prevent floods in another way. It reduces the erosion of soil by rainwater. If there is little or no vegetation, rainwater cuts and carries with it a lot of topsoil. This soil is deposited on the riverbed, which reduces the depth of the river. This results in the reduction of the capacity of the river to carry water. Thus, with even a little rain, the rivers are flooded and they overflow their banks, causing damage. On the other hand, if the surface of the land is covered with vegetation, then soil erosion is greatly reduced.

For example, let us take the case of the Ganga. Earlier there were dense forests on the

Himalayas from where the Ganga and its tributaries originate. In recent years there has been a large scale felling of trees and hence the forest cover in the Himalayas has been reduced considerably. As a result, every time there is heavy rainfall, the rainwater rapidly flows down the slopes of the mountains and fills up the floodplain of the river. The waters also bring a very large quantity of silt and deposit it on the riverbed. This results in frequent floods, which cause heavy damage to

life and property along the river.

All this tells us the importance of protecting our forests and increasing the vegetative cover over other lands.

- *Can you explain how forests and vegetation can help in preventing floods?*
- *Can forests and vegetation help in lessening the effects of droughts (poor rainfall)?*

EXERCISE

1. Explain how water changes into water-vapour and also how clouds are formed from water-vapour
2. Where does evaporation and cloud formation take place on a large scale?
3. How do the clouds reach deep inland?
4. Where does it rain the maximum – (choose the right option)
 - a) sea coasts that are in the direction of the winds
 - b) mountains that are in the direction of the winds
 - c) lands far away from the seas.
5. Fill in the blanks choosing the correct option (bank, tributaries, flood-plain, river valley):
 - a) A river flows through the
 - b) Streams or rivers joining a larger river are called the of the main river.
 - c) The entire trough of a river which is filled with water during the floods is called the of the river.
6. The Narmada flows from east to west while the Betwa flows from the south to the north. Can you explain this difference?
7. Describe the main stages of the water cycle.
8. Can you explain the causes of devastating floods? In what way is it a natural occurrence and in what way is it man-made?
9. There may be several streams and rivers flowing near your village or town. Find out about them and fill in the table below:

No.	Name	Source	Which river does it join?	Which sea does it meet?

10. Do the rivers in your area contain water throughout the year? Find out from your elders if they had more water in earlier times.

CHAPTER 4

GROUNDWATER RESOURCES

You might have noticed that when it does not rain for several months after the rainy season, streams and tanks dry up; yet we continue to get water from wells. You may also have noticed that in some years when there is insufficient rainfall even the wells dry up within a few months. The wells are recharged once there is rain again. You may have wondered, from where does water come into the wells? Water is found at great depth in some wells and nearer the surface in others. The water of some wells is sweet while that of others is salty or brackish. Come let us find out why this is so.

MALWA PLATEAU AND NARMADA VALLEY

Arlavda is a village on the Malwa Plateau. This village has been facing a severe water shortage in the last few years. A large well called '*Gangajalia*' used to supply water to the entire village. It was considered a very reliable well and its water was supplied even to nearby towns. However, this well too went dry in the summer of 1993. Now people had to travel long distances to faraway wells to fetch drinking water. Arlavda is not the only village facing this problem – this has become a common problem in the villages of the region.

You read about Kotgaon in the Narmada valley in class 6. Here there is no dearth of water. Water is usually available at a depth of 15 to 20 feet. Why is there such a stark difference between Arlavda and Kotgaon? Why is it that while one village has no water shortage another village has to face such acute shortage?

GROUNDWATER

From where do wells get their water? How does water get deep into the ground? Rainwater not only flows down the streams or rivers but it also slowly percolates into the soil. This water accumulates in the ground in the gaps between rocks, pebbles, sand, etc. It also accumulates in porous rocks or in the cracks in the rocks. This is the *groundwater* which we reach through wells.

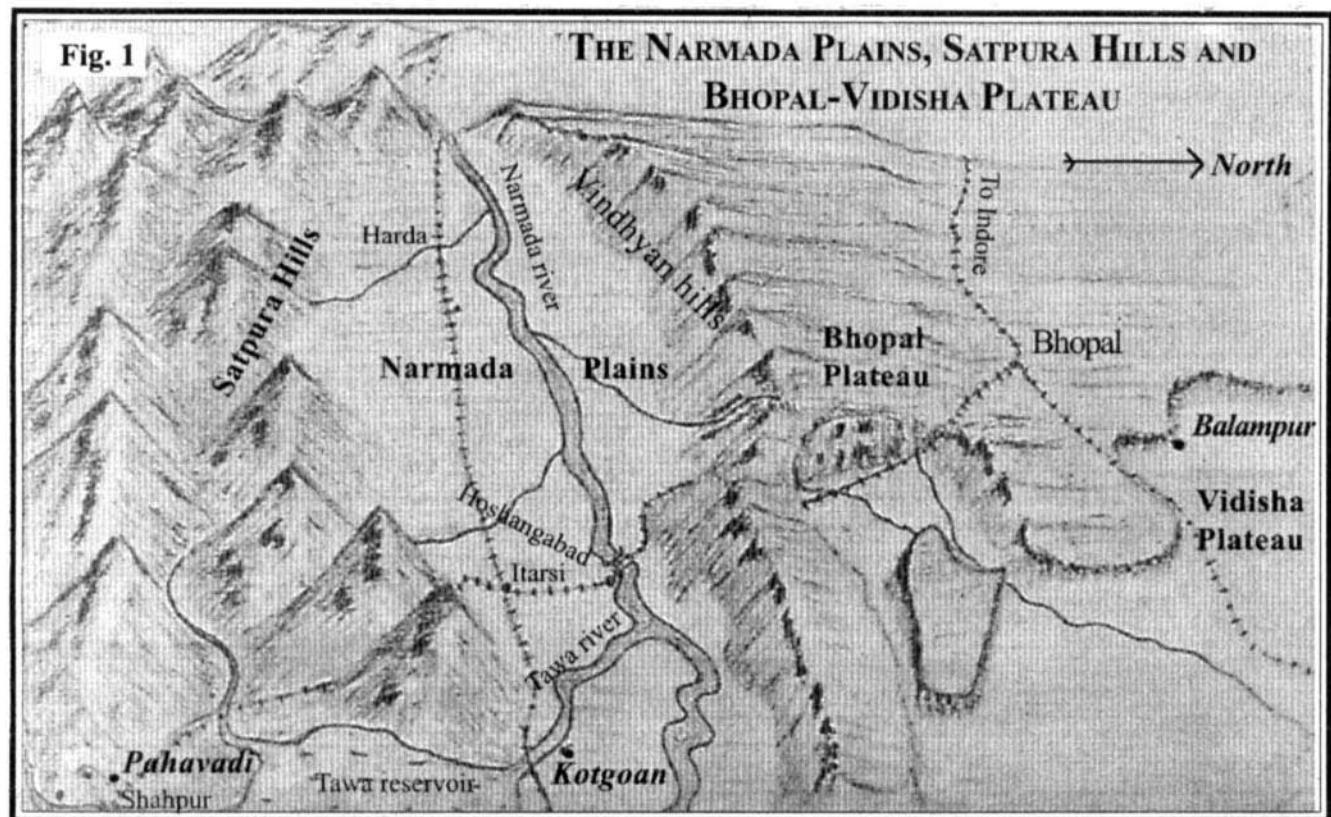
Pervious and Impervious Rocks

Rocks which have cracks or pores (minute holes) in them, and can contain water are called '*pervious rocks*'.

Some rocks are very hard and do not have pores or cracks in them. Water cannot enter into them. Ground water usually accumulates *above* such rocks because the water cannot go underneath them. These are called '*impervious rocks*'.

Fig. 1

THE NARMADA PLAINS, SATPURA HILLS AND BHOPAL-VIDISHA PLATEAU



The arrangement of rocks and soil under the ground is not uniform everywhere. Let us see how this affects groundwater.

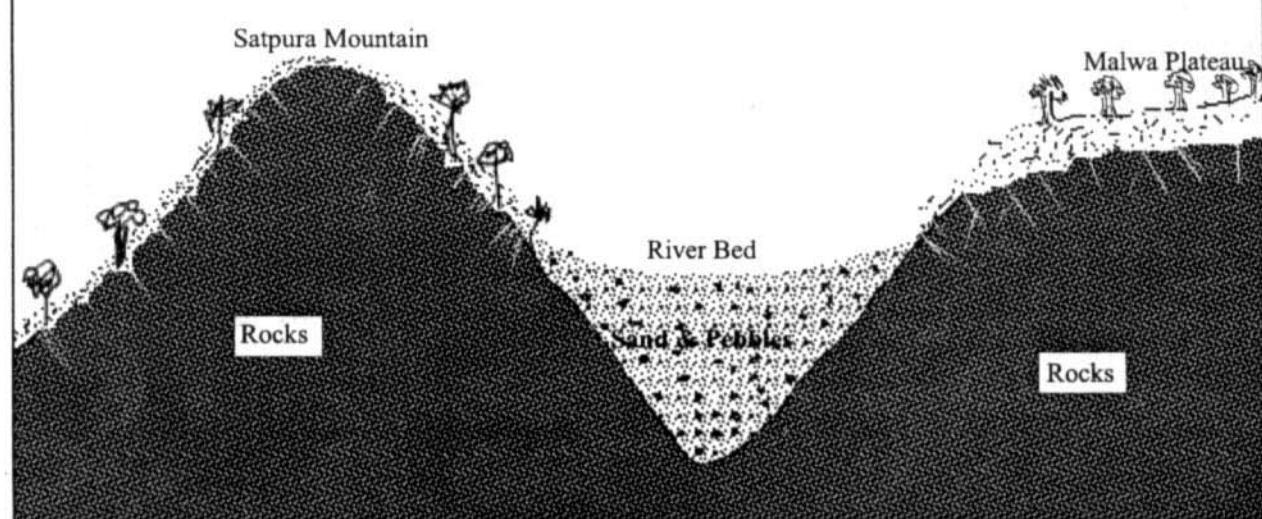
Abundance of Groundwater in Valleys

In Kotgaon, the village in the Narmada valley, it was easy to dig wells and the farmers

were able to irrigate their fields even in hot summer months. Why do the river valleys and plains have so much groundwater?

Look at figure 1 which shows the Satpura hills, the Narmada valley and the Malwa plateau. You can see that rainwater from the surrounding hills collects in the valley. While

Fig 2. Soil and Rock in Plains, Plateaus and Mountains



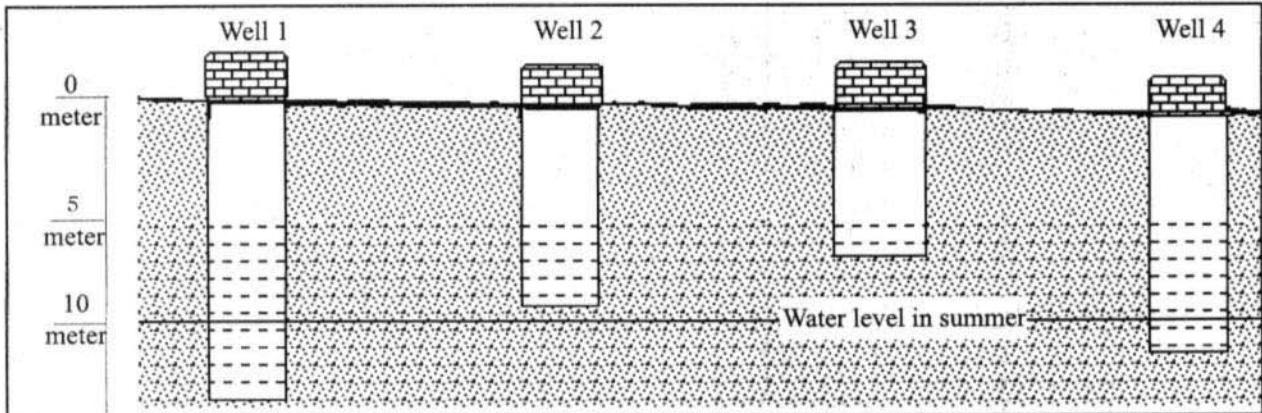


Fig 3 Water Level in the Wells

most of this water flows down the Narmada some of it also percolates into the ground to join the groundwater.

Figure 2 shows the internal structure of the same region. Hard and impervious rocks are not found near the surface in the valleys. Such rocks lie under a large accumulation of sand, silt and pebbles. People who dig bore wells tell us that they do not reach hard rock even at a depth of a thousand feet in the Narmada valley. Rainwater percolates very easily among sand, silt and pebbles. This water accumulates in the gaps between sand particles or pebbles in the ground. It is this which explains the abundance of ground water in the plains and river valleys.

- *Can you explain how the surrounding hills help in increasing groundwater in the river valleys?*
- *How do the sand, silt and pebbles help in increasing the groundwater?*
- *What would happen if the impervious rock in the river valley was nearer to the surface?*

Groundwater in Hills and Plateaus

You may remember that villages like Pahawadi on the hills and Balampur on the plateau are less fortunate with groundwater. You can see in figure 2 that the hard impervious rock is very near the surface of the land on hills and plateaus and the layer of soil is very thin.

Some water accumulates in the cracks among the rocks but this is very little compared to the amount of water that collects in the valleys. This is why the people of hills and plateaus face a groundwater problem.

- *Can you explain the difference in the availability of groundwater in the valleys and hills and plateaus?*

Water Table

Look at the wells in figure 3 carefully. The water level is the same in all these wells. This is the water level in the wells after the rains. You can see that in all these wells water is available at the depth of five meters. This means that if you were to dig a new well in the same region you would strike water at the same depth. This is the level of groundwater, which is also called the 'water table'.

You know that in summer the water level falls and you have to reach deeper and deeper to get to the water. The water table in summer is shown by a continuous line in figure 3.

- *Which of the wells in figure 3 are likely to go dry in summer? Which of the wells will continue to have water?*

Figure 3 showed wells on a level ground. Now we shall look at a situation where the land surface is uneven and undulating. Look at figure 4. You can see two houses on either side of a river. One of them belongs to Lakshmi

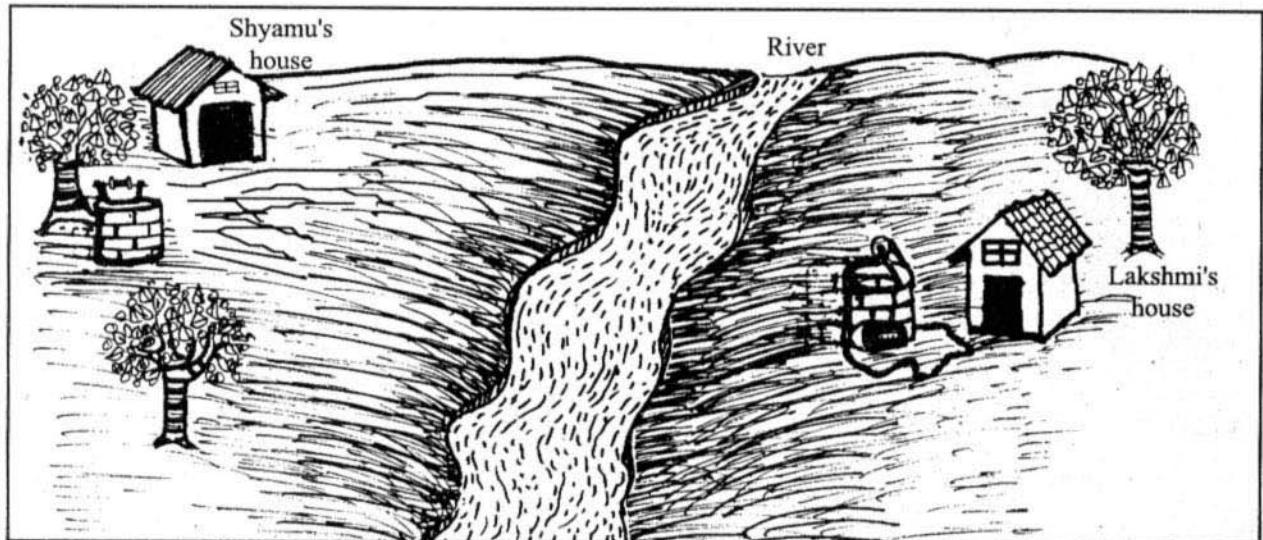


Fig. 4

and the other to Shyamu. Both the houses have a well adjoining them. Even though both the houses are at the same distance from the river, Shyamu had to dig deeper to get to the water in his well whereas Lakshmi did not have to dig so deep. Shyamu was surprised by this. What could be the reason for this difference? Let us look at figure 5, which shows the internal structure of the area.

- *Can you explain to Shyamu why he had to dig deeper than Lakshmi to reach the water table?*
- *You can see that the water table in both the places is the same. But Shyamu's house is situated at a higher ground than Lakshmi's. Had their houses been on the same level then they would have struck water at the same depth. Do you agree with this answer?*

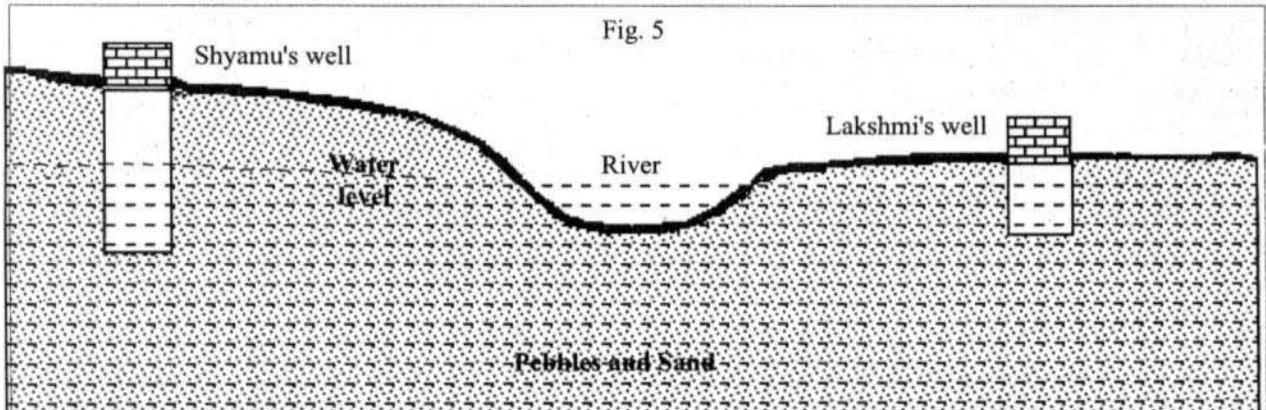
Percolation of water

Figures 3 and 5 showed wells on the plains where ground water is found mainly in sand and gravel deposits underground. Water percolates easily through sand and mud. The larger the grains of sand or soil the faster is the rate of percolation. That is why water percolates faster into sand whose grains are big, and slower into clay, which has very fine particles.

Groundwater is also found in plateaus and hills where the soil/sand cover is thin and there are underground rocks. How does water enter the rocks? Let us study the wells of Balampur, which is situated on a plateau.

In Balampur the underlying rocks are made of red sandstone which is hard and does not absorb water. However, these sandstone rocks have cracks in them and water collects in these cracks after percolating down from the

Fig. 5



topsoil. When wells are dug here, it is necessary to reach these cracks to strike water. Water springs forth from the water bearing cracks. This point is illustrated in figure 6 which shows the internal structure of a plateau region, just as you can see the insides of a cake when you take out a slice from the cake. On the top is a layer of soil. Beneath this layer are red sandstone rocks which have joints and cracks between them. Groundwater collects among these joints and cracks. In this figure water has been shown in dark black. These cracks are mutually connected. As a result water from one crack flows into another and more and more water collects in the lower reaches of the rock. The roots of the trees, which grow in these parts draw moisture from these cracks.

Look at figure 6 carefully and answer the following questions:

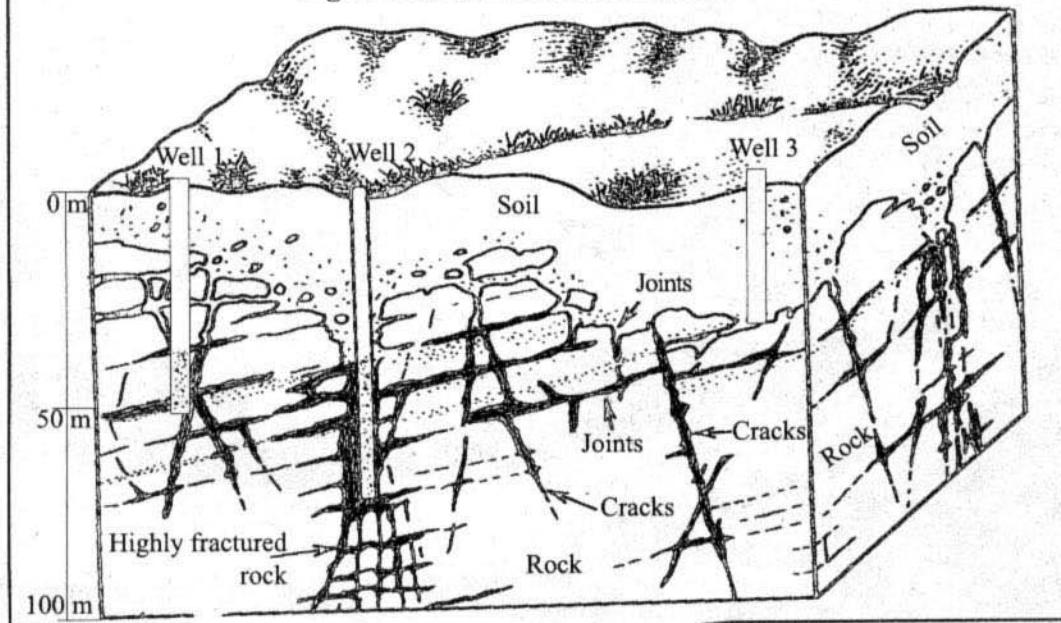
- **In which well are you likely to get more water, in well 1 or well 2?**
- **Why is well 3 dry?**
- **In what way would well 2 benefit from its greater depth?**

Not all plateaus have sandstone rocks under the soil. Things are a little different in the Malwa plateau near Indore or Dewas. Let us visit a village in this region to see how groundwater is obtained here.

WELLS IN THE MALWA PLATEAU

If you dig a well in Malwa you will find a layer of *murrum* beneath the layer of black soil (see figure 7). This layer of *murrum* is of varying thickness - it is deep in some places and shallow in others. *Murrum* absorbs a lot of water. When the *murrum* is full of water, the water percolates beneath this layer to enter the next layer of soft rocks. There is a layer of soft greenish rocks beneath the *murrum*. These are porous rocks and they too absorb a lot of water. Under these soft rocks you will find a layer of hard black rocks. These may contain some cracks on the upper side but there are no such cracks at the bottom. These are impervious rocks – rocks which do not allow water to percolate into them. Since water cannot enter them, it collects above them. They, in fact, act like the bottom of a vessel above which any

Fig. 6 Ground Water in Plateau



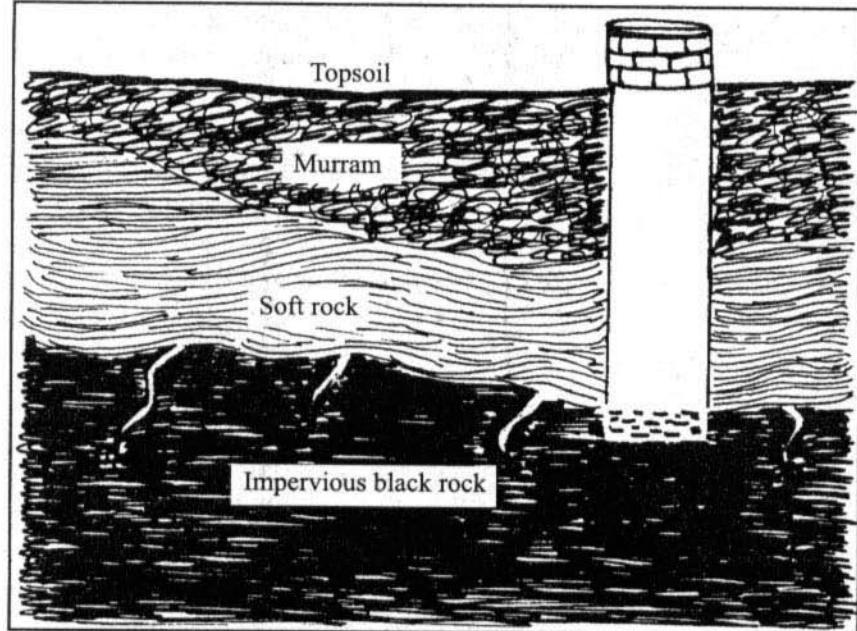


Fig 7. The underground structure in Malwa plateau

liquid can be stored. When digging wells people take care to dig till they reach these rocks so that they can get the maximum amount of water.

Interestingly, even within the Malwa plateau the internal structure varies from place to place. It is not necessary that you find the structure as described in figure 7 in all the villages. The depth of the different kinds of rocks may vary and in some places you may not find a rocky layer at all.

Tubewells

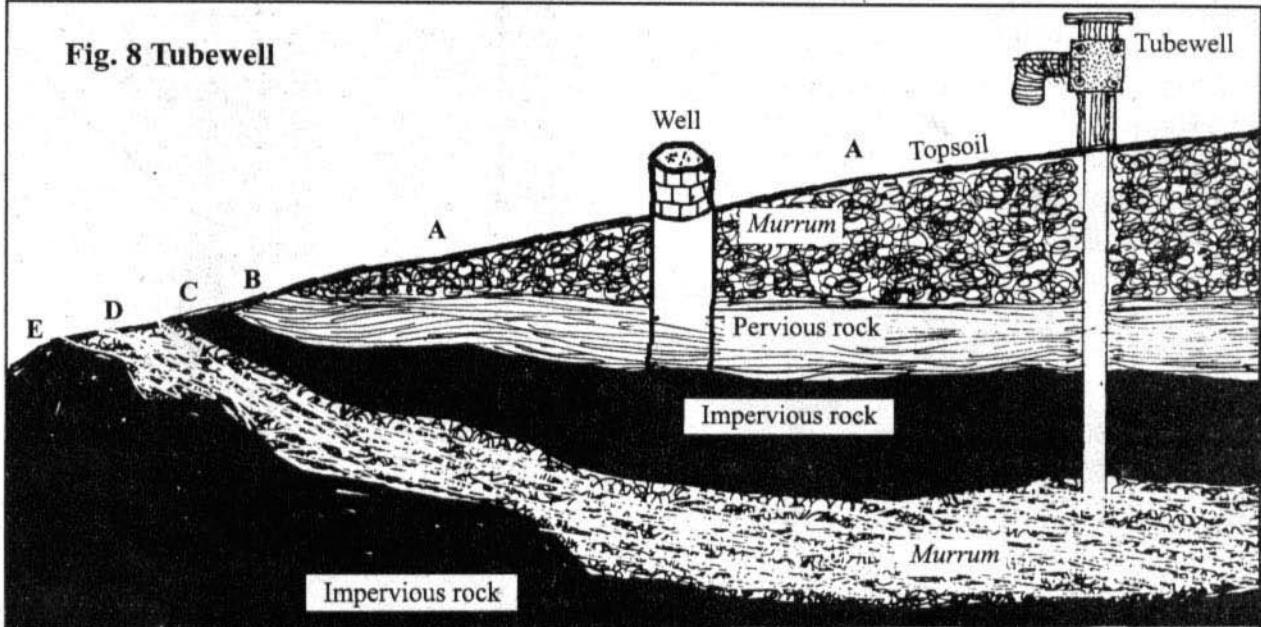
You may have seen people digging bore-wells, also called tube wells. These are drilled deep, cutting into several layers of soils and rocks, both pervious and impervious. That is why digging tube wells is very expensive. However, tube wells give plenty of water.

Look carefully at figure 8. Identify the black impervious rock layers. Water cannot enter into them or percolate into them. However,

there are water-bearing soft rocks beneath these hard rocks. That is why the tube well has been dug across the impervious layer into the lower water-bearing layer.

- *Study figure 8 and answer these questions:*
- *Of the five layers shown in the figure into which layers can rain water enter?*
- *Which of the layers contain impervious rocks?*
- *How does water enter layer D even*

Fig. 8 Tubewell



though it lies under an impervious rock layer?

- *Looking at this picture, can you explain why the tubewell is likely to have more water than the well?*

RECHARGING GROUNDWATER

In our part of the country it rains only for about three to four months. For the rest of the year we are dependent upon groundwater. Rivers, wells and ponds all get their water from these groundwater sources. Can we help to increase groundwater?

You may have noticed that water flows swiftly on naked ground which has no cover of trees or grasses, as there is nothing to stop the flow. Then water quickly flows into streams and into rivers. However if the flow of the rainwater were to be checked by vegetation or *bunds*, then there is a greater possibility of the water percolating into the soil to join the groundwater. That is why vegetation like trees and grasses and *bunds* are used to enhance groundwater. Over the last few years great efforts have been undertaken to 'harvest' rainwater through these means. These measures are usually taken around a stream or river. Hence such efforts are called 'watershed development projects'. Under these projects trees and grasses are planted on the hill slopes from where a stream starts and small *bunds* are built across small *nullahs* and streams to stop the flow of water. Small check dams are also built across streams to store water for a longer time. All this helps to increase or 'recharge' groundwater.

- *Are there any watershed development projects in your area? Try to visit the site and study how it is done. Try to draw a sketch-map of the project area.*

Depletion of Groundwater

If we draw more water from the ground than the water that percolates down, the total

amount of groundwater will decrease over time. Finally there may be little groundwater left for us. This is what has been happening during the last few years. We have been drawing enormous amounts of water through tube wells and pumps to run factories, provide water to cities and irrigate the fields. However the amount of water that percolates into the soil has declined due to cutting down of forests. As a result the groundwater has been decreasing steadily. That is why wells have to be dug deeper and deeper to reach this water.

The problem cannot be solved if one or two persons reduce the amount of water they are pumping out of the ground. This is because all groundwater in a region is connected and the water keeps flowing underground. If too much water is extracted from the ground then all the wells of a region will be affected at the same time. It is therefore necessary that all people in a region come to an understanding about regulating the use of ground water.

Depletion of ground water has become a major problem in Malwa plateau. Increasingly wells are going dry and people have to dig deeper and deeper tube wells. As such, providing even drinking water to the villages and towns is becoming very difficult these days. This problem is not unique to Malwa as it is also being faced across the country.

- *Do you think it is permissible for any farmer or factory owner to pump out as much water as he pleases from his tube well? What will be the consequences of such action?*
- *What steps do you think need to be taken to address this problem?*

Excess of Groundwater

So far we have been reading about shortage of groundwater. Excessive ground water also poses problems in many regions. In Hoshangabad district a dam has been built across the river Tawa. The dammed water is taken to villages through canals. Due to seepage

from these canals and over-irrigation, the level of groundwater has risen in several villages. In these villages we can scoop out water from the wells with just our hands! Due to the rise of groundwater level agricultural land has become marshy and uncultivable. Excess groundwater also causes many other problems like salination of soil, contamination of drinking water, etc.

- ***Find out more about these problems with the help of your teacher.***

Why is Water from a Well Pure?

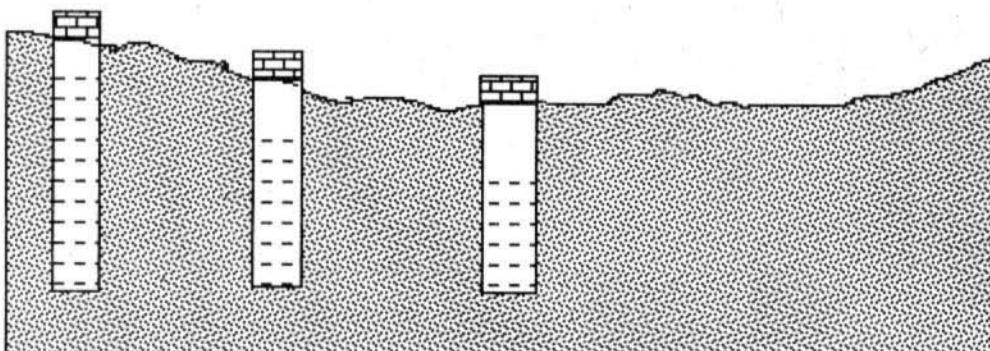
Even when water is available from tanks and rivers, people prefer to drink well water. Do you know the reason? A lot of dirt and decomposing matter mixes with the river and tank water. On the other hand, when water percolates through the ground it passes through sand and mud which act as very fine filters, purifying the water in the process. That is why well water is pure.

EXERCISES

1. Correct the incorrect sentences:

- Water flows from the plains to the plateau.
- There is a thick deposit of sand and gravel in the plains.
- According to figure. 3 the summer water level is below 5 meters from the ground.
- It is easy to dig wells in Balampur.

2. The wells shown in this figure are situated on the plains of the Narmada. But there seems to be a mistake in the figure. Can you correct it?

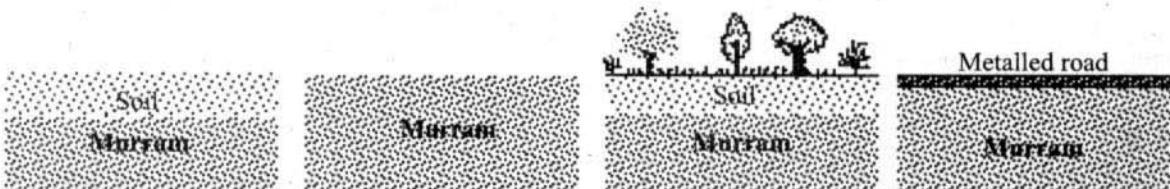


3. Write eight sentences about the Narmada valley on the basis of figure 1 and 2.

4. Discuss the difference between digging a well in the Narmada valley and in the Malwa Plateau.

5. In several places in the Malwa plateau water is to be found beneath a layer of black impervious rock. How is this possible - explain in your own words.

6. In which of these places do you expect maximum percolation to take place?



7. When the owners of some wells in Pipalakhedi started using high-powered motors to draw water from the wells, the owners of the other wells noticed that their wells were drying up. Discuss the possible solutions to this problem.

8. In areas where there is shortage of groundwater, should there be any restriction on digging tube wells?

CHAPTER 5

LIFE-GIVING SOIL

Soil is a very important natural resource. Forests, crops, grass and bushes grow on the soil. If you uproot any plant you can see particles of soil sticking to its roots. Roots absorb water and minerals from the soil for the plant. Trees have a very large network of roots, which reach deep into the soil.

HOW IS SOIL FORMED?

Have you ever wondered where soil comes from? As you know, there are several kinds of rocks on the surface of the earth. These

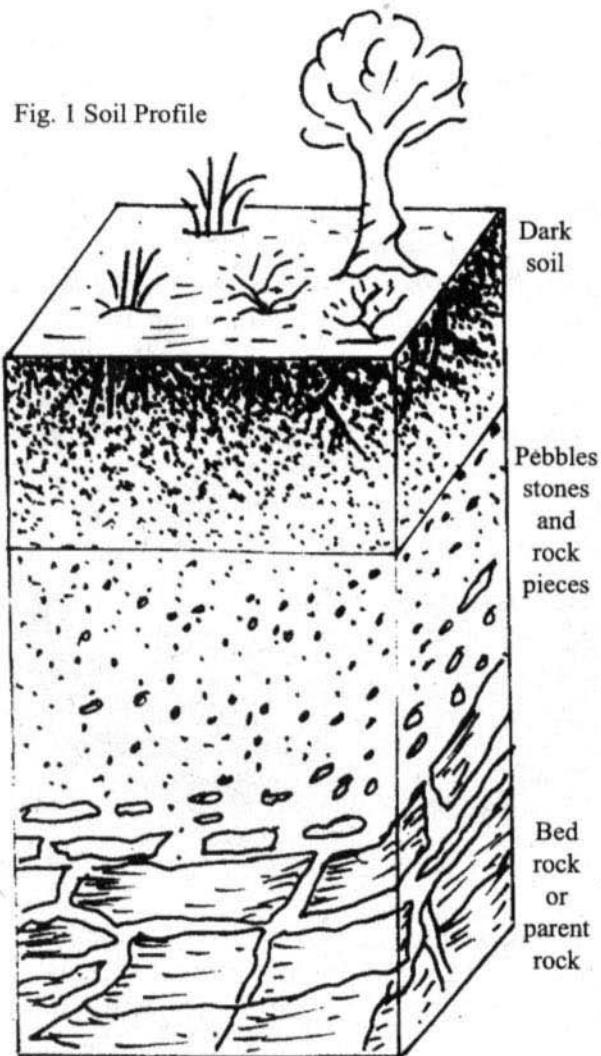
rocks are worn off due to the action of wind, water, heat and cold and they break up. This process is called 'weathering' and it is a very slow process. Gradually the rocks are turned into small stones or pebbles and these in turn are further broken into sand and soil particles.

If you look around a nearby hill slope you will find pieces of broken rock, pebbles, and large sand particles spread over that area. These have broken off from the hard rocks there. It is from these that the soil of the area is formed.

Since the soil is formed from rocks, soils usually contain all the elements that make up the rocks. For example the soil of Sehore district is made of very fine particles of deep black colour. It is derived from the black rocks, which were formed after the cooling off of volcanic lava. On the other hand in Tikamgarh district the soils are made of coarse particles with a large proportion of sand and are reddish in colour. These soils have been formed through the weathering of red sandstone found in the region.

- *Find out with the help of your teacher what kinds of rocks are found in your region, and what kinds of soils are found.*

Fig. 1 Soil Profile



SOIL PROFILE

Have you ever seen a well or a large trench being dug? If you have seen one being dug you may have noticed that different kinds of soil come out of the same pit. You can clearly see the different kinds of soil on the sides of a freshly dug pit. Figure 1 shows the structure of soil under the ground. Look at the figure carefully.

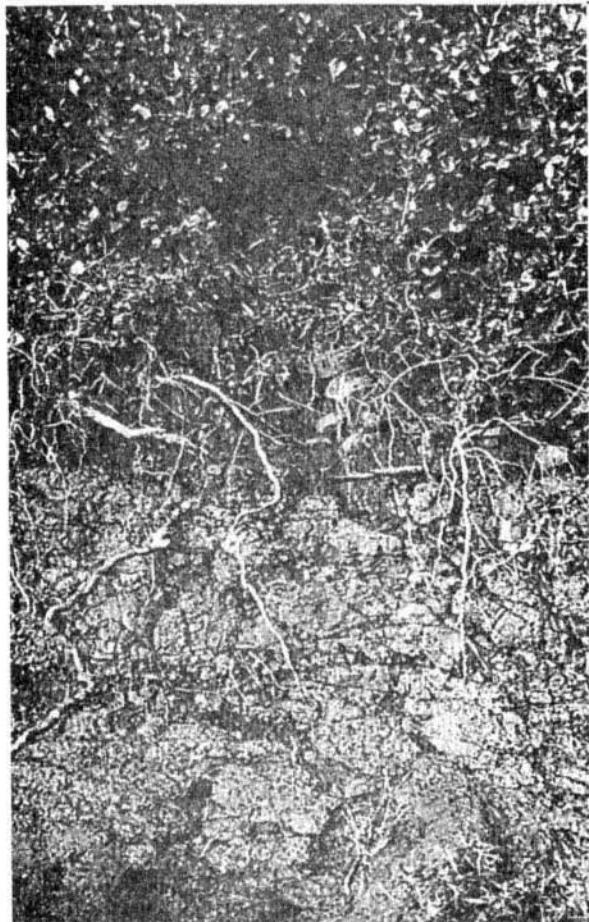


Fig. 2 Photograph of soil profile

- *Describe the soil, which is on the very top – in which are found roots of trees and plants.*
- *Describe the layer of soil, which is below the top layer.*
- *Describe the layer, which is right at the bottom.*

Usually a layer of dark soil is found just beneath the surface. This is the ‘*topsoil*’. The fertility of the soil is determined by the thickness of this upper layer of the soil. If you look at it carefully, you will find that this layer contains the decomposed grasses, leaves, roots, etc. This is organic matter (derived from living things) and is known as ‘*humus*’. Roots of the plants spread out in this upper layer. From here they draw the necessary minerals and salts for the plants.

• *Look at figure 2 and answer these questions:*

Is the spread of the plant roots more in the upper layer of the soil or in the lower layers?

Can you see any cracks in the underlying rocks?

Do you see any root penetrating into the hard rocks?

You can do a little experiment to identify humus in any soil. Put a spoonfull of the top layer of soil in a glass of water and stir it. You will notice that a part of the soil settles down at the bottom and another part floats. Look at the portion that floats in water carefully. This is the humus.

Beneath the topsoil is to be found the ‘*subsoil*’. The second layer of soil is lighter in colour and also harder. The humus content of this soil would be very low.

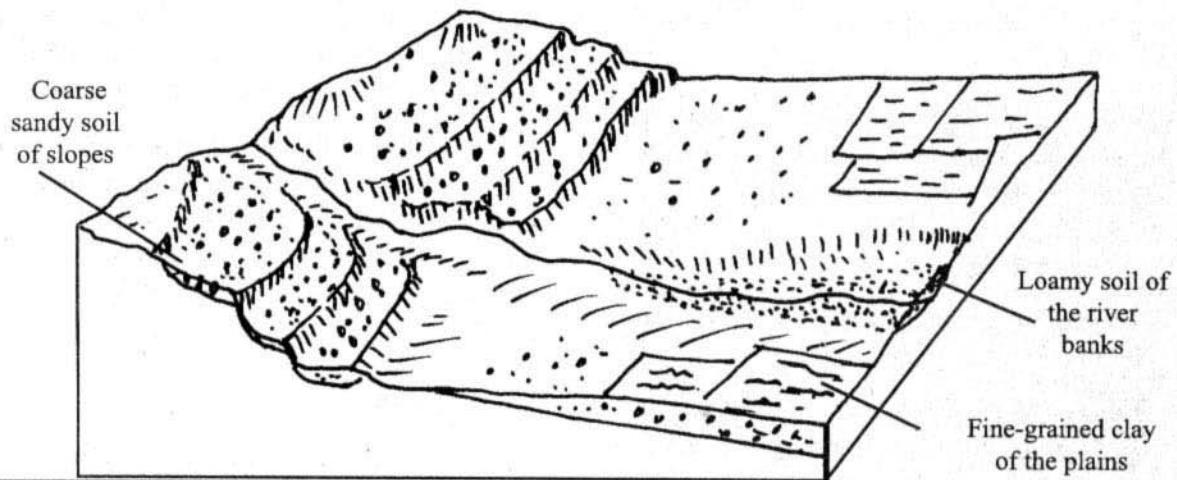
Below this layer, the proportion of fragmented rock materials in soil increases. These have been formed as the result of breaking up of the hard rocks. Its further fragmentation into finer particles results in the formation of soil. The hard rock, which lies below this layer, is known as ‘*parent rock*’. It takes a very long time for the soil to form through the weathering of this parent rock.

- *List the differences between the top soil and the subsoils.*
- *What is meant by ‘parent rock’?*
- *Which part of the soil contains maximum plant nutrients*

LAND-FORM AND SOIL

The soil is not always found at the same place as the rocks from which it has originated. Rivers, streams and winds transport the soils to other places. That is why you find a thick

Fig. 3 Land-form and soil



layer of soil in river valleys and a very thin layer on sloping hillsides. So, the soil, which is found in any area, may not have been produced from the rocks of the area. It could have been transported from other places.

If you take a tour of a village you will notice that the village has different kinds of soils in different places. Figure 3 shows the soil types in a village we had visited. This village had a rocky upland on one side and also a river flowing near it. We examined the soil near the river and found that the soil here was not sticky and had a mix of both dark clayey soil and sand. This is called loamy soil. The farmers told us that this has been deposited by the river when it floods the surroundings in the monsoon. Evidently this soil on the banks of the river has been transported from elsewhere. Looking at the crops standing on this soil we realised that it must be fertile and well suited to the crops.

- You had read about soils in the three villages situated on hills (Pahwadi), plains (Kotgaon) and plateau (Balampur), respectively, in the previous class. In which of these villages did you find such 'loamy' soil?

As we walk towards the rocky upland we notice that broken pieces of rock are strewn all over. There is some soil amidst these rock fragments. The soil is sandy and coarse grained.

It seems that the rainwater has washed away the finer soil particles for the soil deposit there is very thin. We could not see any crops on this land though we could see the stubble of some millet crop harvested after the rains. The farmers told us that the soil here cannot support a crop every year and they had to leave it fallow every alternate year. Only *kharif* crops (monsoon crops) can be raised on this soil, as it does not have the capacity to retain water. You may have read about similar soils in Pahwadi village on the hills.

It is a different picture altogether in the flatlands of the village. The soil here is neither coarse and sandy as in the uplands nor loamy as on the riverbanks. The soil here is made of fine-grained clay. It is fertile soil with a lot of humus, and crops like wheat grow well in it.

- *The soil of these three different places, consisted mainly of these four substances:*

1. 2. 3. 4.

All soils are made of these four substances. The proportion of one or the other substance may vary from one kind of soil to another and they are classified accordingly. If the soil had a higher proportion of sand it is called sandy soil, if it has a high proportion of very fine clay, then it is called clayey soil. If it

is composed primarily of large grained particles and clay, then it is called silt. If the proportion of sand, clay and silt are equal then it is called loamy soil.

- Does soil vary from place to place in your village or town too? Take samples of different kinds of soil and try to classify them according to the size of their particles.
- Trace the uplands in figure 3 with your finger.
- Why is it that these uplands are covered with gravel and stones and rock fragments? What happened to the fine soils?
- How was the fine soil deposited along the river? What is that kind of soil called?

Absorption of water in soil

Sandy soil absorbs water very fast while clayey soil absorbs water very slowly. Do you know why? The capacity of soil to absorb water depends on the size of soil particles. Larger the size of soil particles, greater would be the space between different particles. Water gets absorbed in this space. This space also allows water to pass (percolate) through the sand. That is why sandy soil cannot retain moisture as it allows water to pass easily. As a result there is little moisture available for crops in such soils. On this soil, farming is possible only in *kharif* or rainy season or with the help of artificial irrigation.

On the other hand, soils with finer particles are very closely joined and have very small pores, so the process of water seepage is very slow in them. Water takes longer time to pass through this soil. Once the soil gets wet, it retains the moisture for long. In such soils, farming is possible without irrigation also. This soil expands after absorbing the water and shrinks and cracks after drying up. It also becomes very hard on drying up and it gets very difficult to plough this land

when it is dry. On the other hand when it rains this soil gets very sticky and it is again very difficult to plough. That is why such soils are cultivated only in *rabi* season, that is, after the rainy season is over and before it gets too dry.

Loamy soil does not expand or get sticky after rains. It can also retain water longer than sandy soil. That is why it is considered good for agriculture and both *rabi* and *kharif* crops like rice, wheat, gram, sugarcane etc. are raised on it.

Soil Erosion

If you look at fields after rains you can see a number of small drains on the ground. If you walk along a river you can see many such drains or gullies through which water flows after the rains. These also dig out the soils and carry them to the rivers. Thus deep gashes are formed on the land. This is called soil erosion or washing off of soil by water. Soil erosion is also caused by other factors like winds, which blow the soils away. Soil erosion is very harmful, as fertile soils are lost. If you remember, these soils settle down on riverbeds and increase the threat of floods.

Conserving soils

What should we do to stop soil erosion? Observe carefully the gullies where soil has been eroded. You can see how the roots of the grass, plants, trees, etc. hold on to the soil. In fact, they bind the soil and prevent it from being washed off or blown off by winds. Absence of such vegetation tends to greatly increase soil erosion. That is why tree plantations, or even growing of grasses is undertaken in areas worst affected by soil erosion.

You may remember from class 6 that people make terraced fields in Indonesia to conserve water and soils on the hill slopes. This technique can be adopted even in ordinary fields. If farmers raise the *bunds* or boundaries of their fields, water will accumulate in the fields and slowly seep into the soil, and not flow off rapidly with the soil into the rivers. In fact,

in sloping fields, this even helps to increase the depth of the soil. You may remember reading about a farmer adopting this method in Balampur.

- *Are any steps being undertaken in your village or town to conserve soils? Discuss what is done there.*

EXERCISES

1. How is soil formed?
2. Why is the colour of soil in Sehore district black while it is reddish in Tikamgarh district?
3. Why is the topsoil dark in colour?
4. How is soil transported from one place to another?
5. Why do you find gravel and pebbles, in large quantities on hill slopes?
6. Why do you find deep and fertile soil in river valleys?
7. Describe the three layers of soils as we dig from the surface. Draw a diagram to explain your description.
8. Why does water percolate faster through sandy soil as compared to clayey soil?
9. How does thick vegetation help in reducing soil erosion?
10. What do you understand by '*humus*' and '*parent rocks*'?
11. Draw what you understand by a) terraced fields b) gully plugs c) check dams
 d) raised boundaries of fields

a) terraced fields	b) gully plugs
c) check dams	d) raised boundaries of fields

CHAPTER 6

EUROPE

In class 6 we had read about Asia and some countries of that continent. This year we shall study two more continents, Europe and Africa. We will begin with a lesson on Europe. The industrial revolution, which inaugurated the modern industrial age, began in Europe 300 years ago. Today, the people of Europe have attained high levels of income, education, health, etc. In the following two lessons we shall read about the land and climate of Europe and how modern transformation came about in the countries of Europe.

LOCATION OF EUROPE

In order to find out the location of Europe and to see how far it is from India you will need an atlas or a globe. To begin with, look at Map 1 in which Europe has been shaded. Identify the boundaries of the continent of Europe.

- What is the name of the ocean to the north of Europe?

This ocean is frozen most of the year. In your previous class, you had also read about the Asian Tundra, which is on the shores of this frozen ocean.

- Name the ocean to the west of Europe.

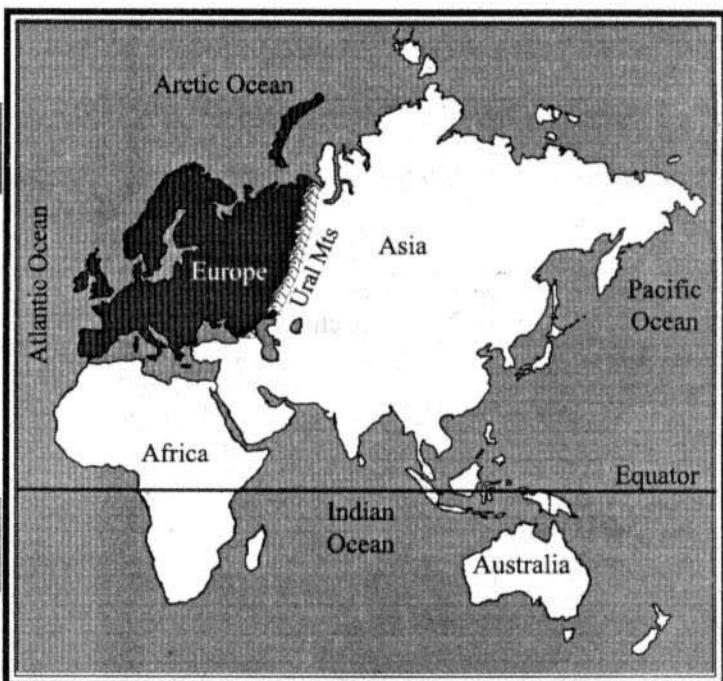
This ocean separates the continents of Europe and North America. About 500 years ago the people of Europe discovered the sea route to America and millions of Europeans migrated to the continent of America and settled down there.

- Look in the atlas and find the name of the sea just south of Europe.

This sea separates Europe in the north from Africa in the south. The name

of this sea means 'middle of the world'. Do you know why it is called by this name? In ancient times the people of Europe did not know about other continents like America or Australia. They only knew about Europe, western parts of Asia and northern parts of Africa. You can see that all these regions are situated around the Mediterranean Sea. That is why Europeans thought that this sea was in the centre of the world and named it so. It has been known by this name ever since.

Map 1 Location of Europe



- Name the mountains to the east of Europe.

These mountains are not very high and they form the eastern boundary of Europe. To the east of these mountains is Asia while Europe is to their west. In fact Asia and Europe are one continuous landmass. This landmass is therefore called Eurasia.

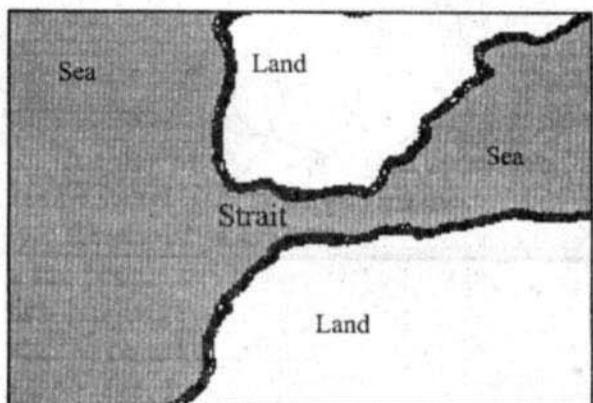
Can you see a vast lake to the south of the Ural Mountains? It is called the Caspian Sea because it is so vast and its water is salty. This sea, too, forms the boundary between Asia and Europe with Asia to its east and Europe to its west.

Look at the two interconnected seas to the south of Europe. These are the Black Sea and the Mediterranean Sea. Since the two are connected it is possible to travel by ship, quite easily, from one sea to the other. However the two are connected by a very narrow passage. Such narrow passages between seas are called 'straits'. (Figure 1)

- In Map no. 3 write the names of Atlantic Ocean, Arctic Ocean, Mediterranean Sea, Caspian Sea and Black Sea in the correct places and colour the seas and oceans blue. Take care not to colour the small islands in the seas blue, too.

Look carefully at the map and you will see that the Mediterranean Sea becomes very narrow at one point between Africa and Europe

Fig. 1 Strait



before it meets the Atlantic Ocean. Colour this narrow passage of the sea very carefully. This narrow passage is called the Gibraltar Strait. If any country gets control of the Gibraltar Strait it can control navigation on the Mediterranean Sea. At the head of the strait is the Gibraltar Island, which is under the control of Great Britain (England). The island is the base from where Great Britain controls transport on the Mediterranean Sea.

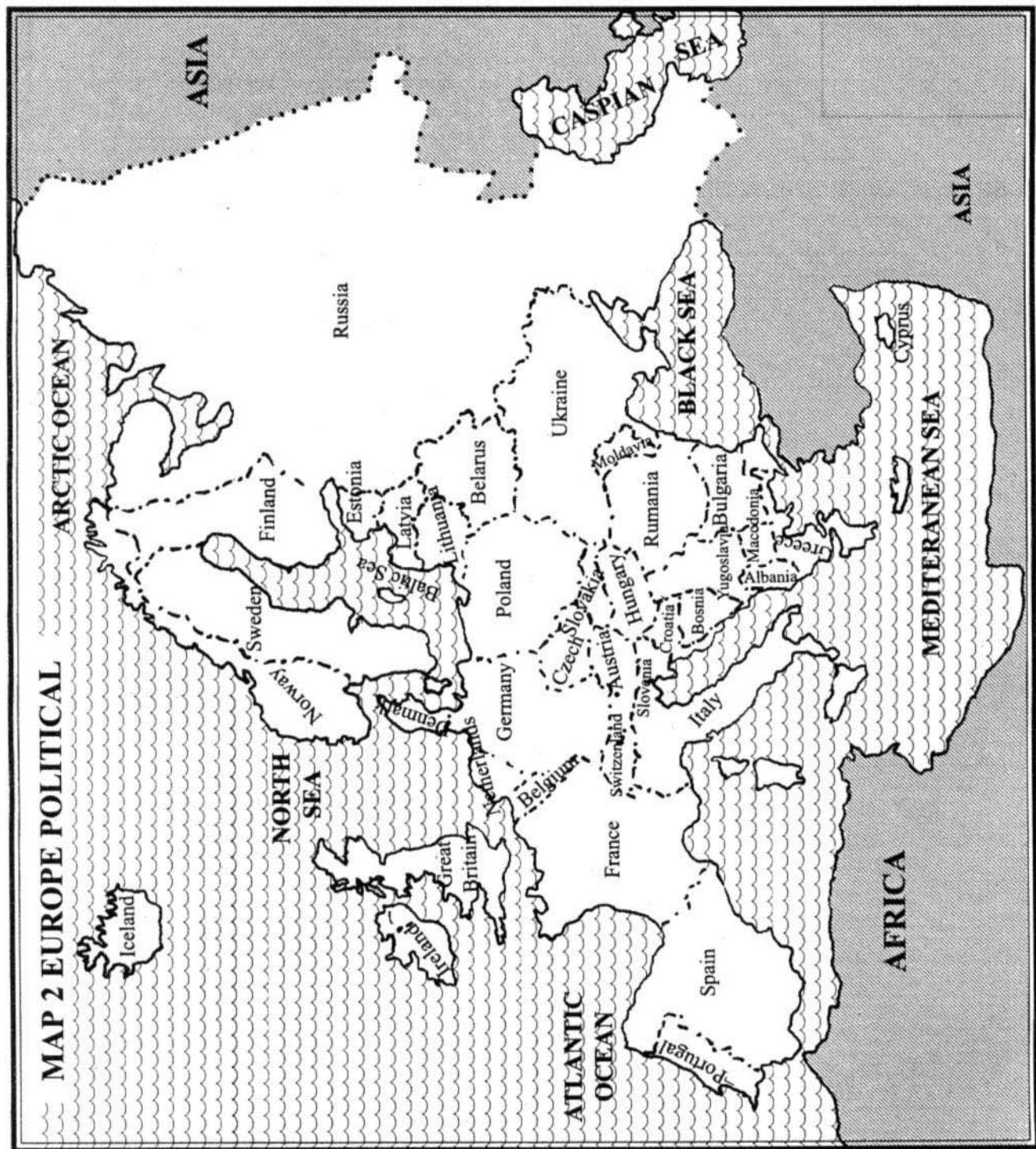
- Now that you are familiar with the location of Europe you can take a look at the countries of Europe. Look at Map 2 to find out their names. Have you heard of some of these countries before?
- Map 3 has been left blank for your use. Write the names of the countries of Europe on this map and colour them in different colours. See that no two neighbouring countries are coloured with the same colour.

MOUNTAINS, PLAINS AND RIVERS

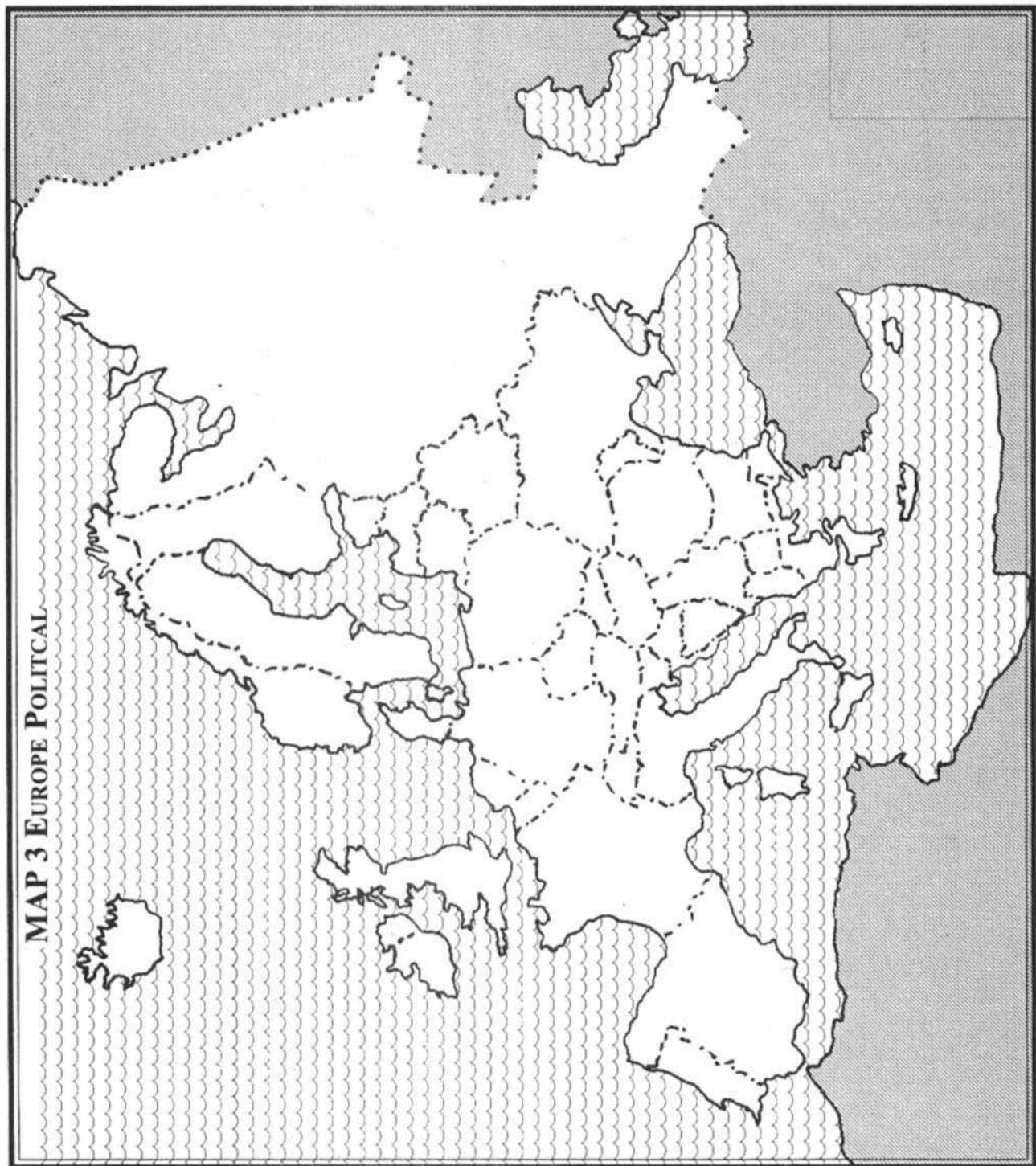
Let us learn more about the mountains, plains and rivers of Europe with the help of Map 4. Europe has several high snow-covered mountains. Look for the Alps and the Pyrenees in the map. The Alps, the most important mountain ranges of Europe, are covered with snow all the year round.

- The Alps stretch across several countries. Find out the names of these countries by comparing Maps 2 and 4.
- Write the names of two rivers starting from the Alps.
- Name the countries across whose borders the Pyrenees stretch.
- Which mountain range is on the eastern boundary of Europe?
- How many more mountain ranges can you locate in Europe? Make a list of their names.

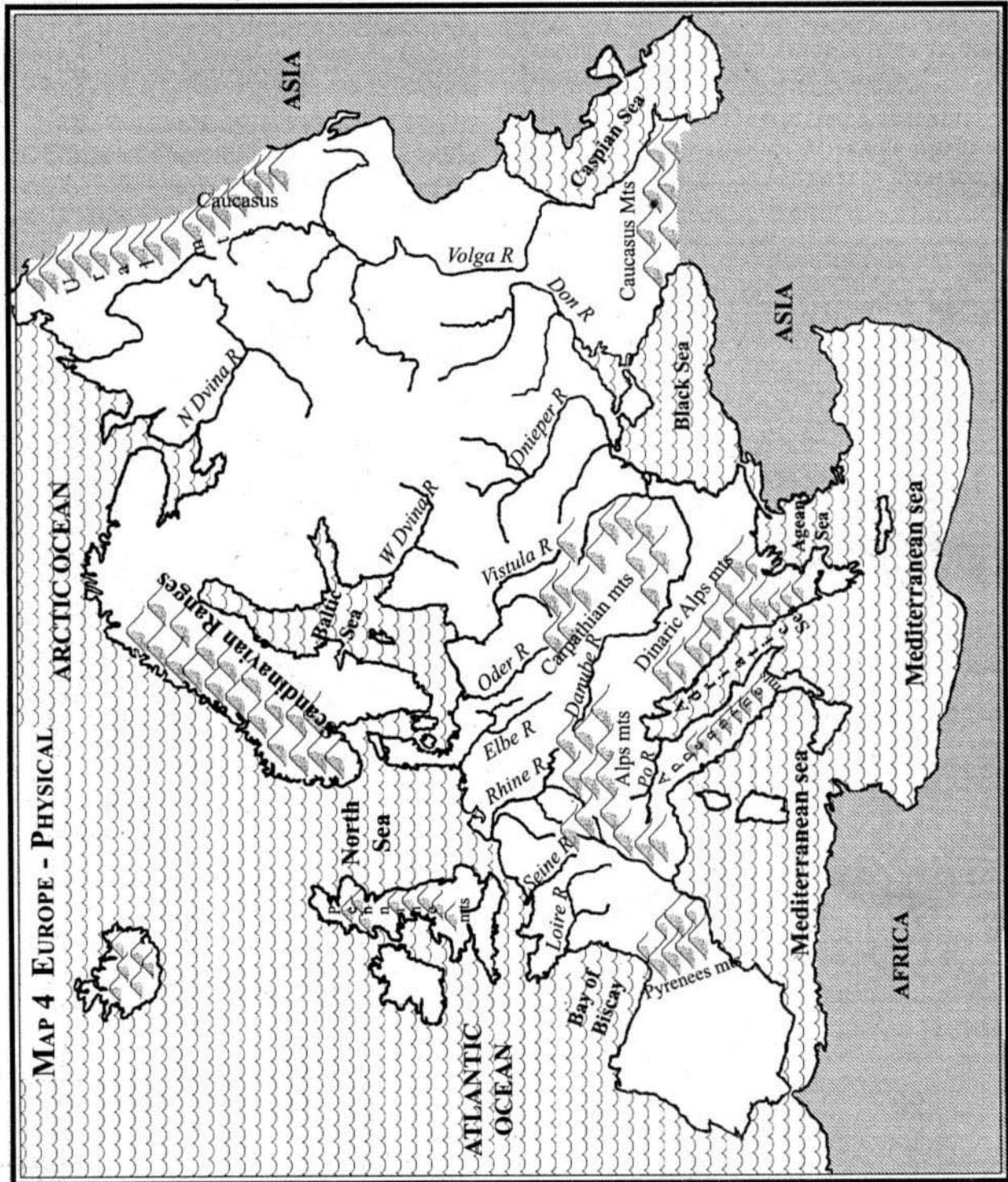
MAP 2 EUROPE POLITICAL



MAP 3 EUROPE POLITICAL



MAP 4 EUROPE - PHYSICAL ARCTICOCEAN



The Caucasian Mountains, which lie between the Caspian Sea and the Black Sea form the southern boundary of Europe. They, too, are very high and covered with snow all the year round.

In comparison, there is a striking difference between Europe and Asia. You may remember that there are several vast plateaus in Asia. However, there are no such large plateaus in Europe. There are only some small plateaus in countries like France, Germany and Spain.

There are vast plains in Europe. The whole of Eastern Europe is a vast plain, which stretches across several countries like Russia, Ukraine, Poland, Belorussia, etc. These plains experience heavy snowfall and bitter cold in winters. When the snow melts in summer, small streams start flowing. These join to form mighty rivers. It is from these plains that rivers like the Dnieper and the Volga, which is the longest river in Europe, originate.

European rivers are used not only for irrigating the fields but also as major waterways. Ships and barges ply on these rivers and transport people and goods from place to place. Since these rivers flow across several countries they also facilitate international trade and transport. In this respect, the Rhine is one of the most important rivers as it flows through several countries and empties itself into the North Sea. There are several major industrial and mining cities on the banks of this river. The Rhine links these cities to the open sea and thus to intercontinental trade. Unlike the Rhine, the Volga drains into the Caspian Sea, which you may remember is a vast lake. Transport to the open sea through this river-way is not possible. Thus, the cities on the Volga are not linked to transcontinental trade through waterways.

- Compare Maps 2 and 4 to answer the following questions:

- Names of countries through which the Rhine flows:

1 2 3 4 5

- Names of countries through which the Danube flows:

1 2 3 4 5

- Names of two mountain ranges on the border of the Hungarian plains.

1 2

- Names of countries which ring the Black Sea.

1 2 3 4

- Names of oceans or seas into which the following rivers empty themselves:

River	Ocean/Sea
1. Seine	
2. Rhine	
3. Oder	
4. Po	
5. Danube	
6. Vistula	
7. Volga	
8. Dnieper	
9. Don	
10. Dvina	

PENINSULAS, ISLANDS AND BAYS

You can see on the map that the sea coast of Europe is very jagged. In several places it appears that the sea has cut deep into the land as in the case of the Baltic Sea. Elsewhere, it would appear that a part of the land has stretched far into the sea as in the case of Italy.

Italy is surrounded on three sides by the sea. Land masses that are surrounded by the sea on three sides and are connected to the mainland on the fourth side are called 'peninsulas' (figure 2). Norway and Sweden are also part of a peninsula. You can check this out in the map. This peninsula is called the Scandinavian Peninsula.

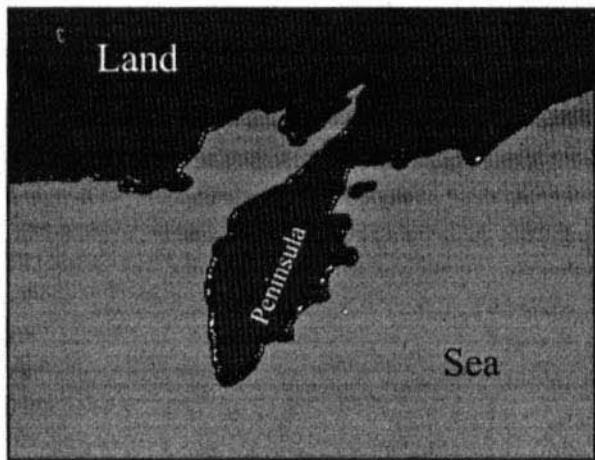


Fig. 2 Peninsula

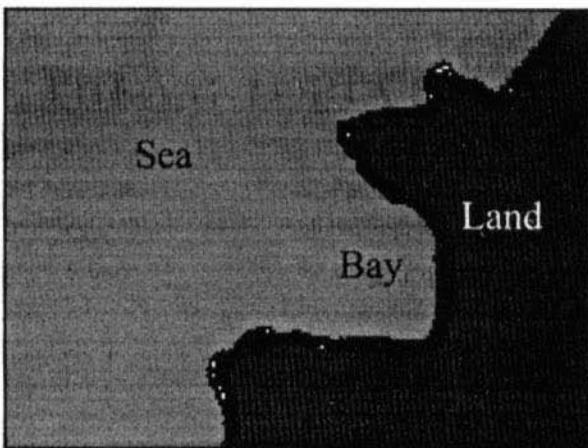


Fig. 3 Bay

- Which of these is a peninsula – Greece or France?
- Are Spain and Portugal a peninsula, too?
- Name the mountain range in the Scandinavian Peninsula.

The sea surrounds some of the European countries, not just on three sides but on all four sides! These are island countries. Great Britain is one such island country.

- Find out the names of some of the other island countries of Europe.

Since ancient times, the seas have played an important role in the lives of the people of these islands and peninsulas. Central and southern Europe is largely mountainous and travel and transport over them is both difficult and expensive. In comparison, sea transport is easy and inexpensive. This is the reason why Europeans have been extensively using sea routes since ancient times.

The presence of a large number of bays and gulfs has also facilitated the use of sea routes. *Bays* and *gulfs* are parts of the sea enclosed by land on three sides. In a bay the land curves inwards and the mouth of the bay is usually wide as in the Bay of Bengal. A gulf is a narrow inlet of the sea and has a narrow mouth. The entire Baltic Sea as you can see in the map is a large gulf. Since the bays and gulfs

are protected from the storms of the high seas they are very useful for building harbours where ships can be safely anchored and cargo loaded or unloaded. Deep gulfs or bays are preferred for building harbours as large ships can be anchored in them. Ships need deep waters so that their bottoms do not touch the sea floor.

- Find out from Map 3 the names of the countries on the three sides of the Baltic Sea.
- Look for the Bay of Biscay, Gulf of Bothnia and the Adriatic Sea on a wall map.

CLIMATE

Europe has a cooler climate than ours. Most of its countries experience snowfall in winter. Their summers, too, are not as warm as ours.

- Why do you think the climate of Europe is so different from ours? Discuss among yourselves in the class.

Distance from the Equator

While reading about Asia, you must have learnt that the regions near the Equator (like Indonesia) remain warm all round the year and as we move northwards or southwards away from the Equator it gets cooler and cooler.

Indeed the Polar Regions are covered with ice all round the year.

- *Look at a globe to see how far north, Europe is, from the Equator.*
- *Is Europe even farther north than India?*
- *Is Europe as far north of the Equator as Japan?*
- *Will Norway be warmer than Italy? Why?*

The Atlantic Ocean

Besides its distance from the Equator, the climate of Europe is influenced by another factor – the Atlantic Ocean and the winds blowing from it. This impact is felt more by the regions along the Atlantic Ocean than the ones which are far inland.

- *To begin with, find out which part of Europe is along the Atlantic Ocean – the eastern or the western part?*

In the winters it is quite cold in Western Europe but it is even colder in Eastern Europe. Thus countries like Poland and Russia have

severe winters while France and Great Britain are comparatively warmer. Russian winters are so cold that the rivers and even the nearby seas freeze. However, this does not happen in the countries of Western Europe along the sea coast.

- *Look at the map to be able to tell whether it will be warmer in Spain or in Slovakia.*

You would have guessed that this difference must be because of the nearness of Western Europe to the Atlantic Ocean. Let us see exactly how this ocean affects the climate of Europe.

Westerlies

Winds blow all the year round from the Atlantic Ocean towards Europe. Since they blow from the west these winds are called '*Westerlies*'. (Actually these blow from the southwest towards the northeast). These winds are warmer than the land temperature and are also moist. The climate of Western Europe is affected by these warm and moist winds all the year round as they blow throughout the year.

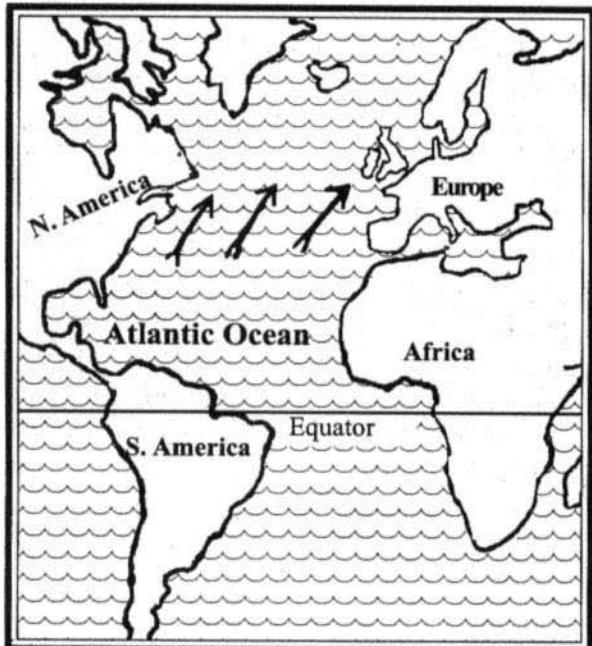
- *Can you guess what the impact of the Westerlies would be?*

Warm Ocean Currents

The waters in the oceans are not static. They keep flowing from one place to another along the continents. These are the ocean currents, which flow for thousands of kilometers in the ocean just as rivers flow on land.

One such ocean current is to be found in the Atlantic Ocean. This current originates near the Equator where the waters are warm throughout the year. This why this current is also a warm current. This current flows westward to North America. It flows north along the eastern coast of America under the impact of the Westerlies and then advances towards Europe. Moving northeast, it hits the western coast of Europe. This current is called

MAP 5 THE WESTERLIES



MAP 6 GULF STREAM



'Gulf Stream' in America, while in Europe it is called 'North Atlantic Drift'.

The coastal waters of the east coast of North America and the west coast of Europe do not freeze in winters, thanks to the Gulf Stream. Thus it is possible for ships to visit the ports on these coasts in winter since the waters do not freeze.

- Why do you think the climate of Eastern Europe is not so strongly affected by the warm currents?
- Fill in the blanks:
 - The waters near the Equator are (warm / cool / icy cold)
 - Starting near the Equator, the Gulf Stream reaches the coast of America. (eastern / western / northern)
 - The Gulf Stream flows in the (Atlantic Ocean / Mediterranean Sea / Black Sea)
 - The waters of the Gulf Stream which hit the European coast are (cold / warm / icy cold)
 - The Westerlies blow from the Atlantic Ocean towards Europe (in winter / in summer / all round the year)
 - These winds are (dry / moist / icy)

Western Europe: Showers all the Year Round

The Westerlies, which blow throughout the year also bring ample moisture to northern and western Europe. Since these winds blow from the sea they carry a lot of moisture and regularly cause rainfall. This is why it rains throughout the year in northern and western Europe. While it rains only for a few months in our country, there are light showers all round the year in western Europe. The skies there are usually clouded. While we, in India, eagerly await cool showers, the people of western Europe long for bright sunny days.

- What differences did you notice between the climates of India and west Europe?

Western Europe also benefits in other ways from the Gulf Stream. The warm currents are very good for fish breeding as they contain ample food materials for the fishes. As a result the fishery industry is very well developed in the North Sea near Britain. This part of the North Sea is called 'Dogger Bank'. Fish is an important part of the food of the Europeans and fishing is a very important industry in Europe.

- Name the countries which would benefit from the Dogger Bank.

Mediterranean Climate in Southern Europe

Let us look at the countries of Southern Europe. All of them have the Mediterranean Sea to their south. They are called 'Mediterranean Countries'. The lands along the Mediterranean Sea have a distinct climate called the 'Mediterranean climate'.

- Look at Map 2 and name four Mediterranean countries.

The Mediterranean countries are the southernmost countries of Europe. As a result the winters here are not too cold and summers are warm. It does not rain all through the year as in Western Europe. The Westerlies blow here

during the winter months only. These winds bring rain to the Mediterranean countries. In other words, it rains here only in winter. Such rainy winters and dry summers are termed a '*Mediterranean climate*'. Several regions in other continents too have a Mediterranean climate. This climate is very good for growing juicy fruits. Thus regions with Mediterranean climate are famous for their fruits. Fruits like olives, figs, grapes, oranges, etc. are grown extensively in southern Europe.

- *Compare Mediterranean and Equatorial climates on the following aspects:*

Seasons:

Rainfall:

- *When does it rain most in your state, in summer months or in winter months?*
- *Find out if your region gets light winter showers and the name given to it in the regional language.*
- *Fishing is of importance in whereas fruit growing is important in*

NATURAL VEGETATION

There is a lot of variation in the natural vegetation of Europe due to the variations in the terrain and climate. Let us begin with the extreme north. Northern part of the Scandinavian countries fall in the polar region. The vegetation there is quite similar to the vegetation in the Asian tundra.

- *Recall the vegetation of the Asian tundra. You read about it in class 6.*

The rest of northern Europe, too, is very cold but not as cold as the polar region. It snows heavily here for six to seven months, but the soil below does not get frozen. Thus trees are able to grow here unlike in the Tundra. However the trees that grow in Northern Europe are of a special kind which can

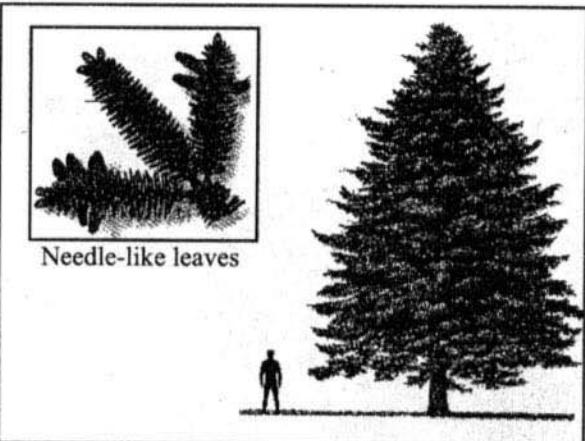


Fig. 4 A coniferous tree

withstand very cold climates. They are conical in shape so that snow can easily slip down and not gather on the tree tops. They have needle-like leaves and bear fruits called 'cones'. Hence they are called '*coniferous trees*' and the forests are called '*coniferous forests*'. Pine, spruce, etc. are examples of coniferous trees. The wood of the coniferous trees is soft and is used for making paper. Coniferous forests are found in Europe in Norway, Sweden, Russia and on the Alps. You would have read about such forests in the lesson on Japan. Such forests are also found in our country on the Himalayas.

Mediterranean forests are found in southern Europe where summers are dry. The trees that grow here have thick barks in order to reduce evaporation and preserve moisture in summer. Olive and cork are typical Mediterranean trees.

The forests of central Europe are different from the coniferous and the Mediterranean forests. Central Europe gets very cold in winter and experiences snowfall in some months too. However, it does not get as cold as in northern Europe or as warm as southern Europe. Central Europe has forests of broad-leaved trees. Their leaves are broader than the needle-like leaves of the coniferous trees. These trees shed their leaves in autumn before the onset of winter. September to November are the autumn months. When it gets too cold in winter the life activities of the trees are greatly reduced and they shed their leaves as a result. As summer

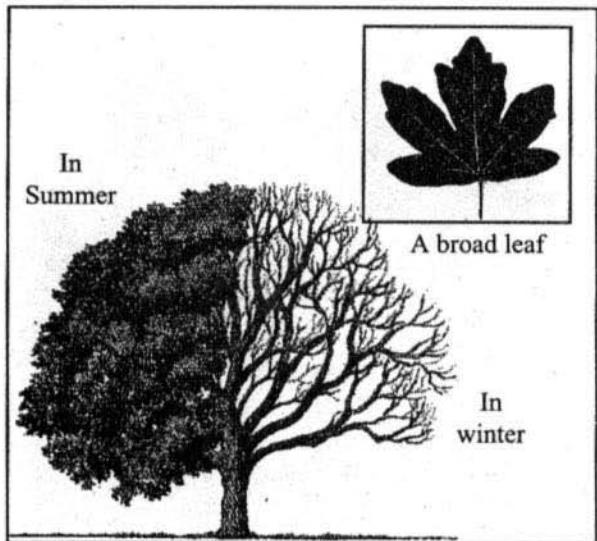


Fig.5 A deciduous broad-leaved tree

sets in, they are covered with fresh green leaves. They are also called *deciduous forests* or forests that shed their leaves annually. The typical broad-leaved trees are maple, birch and oak. These trees also grow in parts of the Himalayas in our country.

There are grasslands on the mountain slopes and plains of Europe. They are covered with short and juicy grasses. These are called '*steppe*' grasslands. Animal rearing is an important activity in steppe grasslands. Wheat cultivation is also very important in these plains. The grass, which grows in the plains of our country, is long and hard. It is not as suitable

for animal rearing as the steppe grass.

- *In which of the following countries will you find coniferous forests – Norway, Italy, Spain.*
- *List two important features of coniferous forests.*
- *Give two important differences between Mediterranean and Equatorial forests.*
- *Why are steppe grasslands more useful for animal rearing than the grasslands of our plains?*
- *Compare the deciduous trees of your area with the deciduous trees of central Europe.*

LAND, CLIMATE AND AGRICULTURE

European plains and river valleys are very fertile. It rains here all through the year and the rivers, too, do not dry up in any season. As a result the plains are very suited for agriculture. However, a very large part of Europe is mountainous and not suitable for agriculture. Some countries have very little agricultural land. For example only 3% of the land of Norway is available for cultivation. 30% of England is cultivable while in Germany it is about 40%.

This is very different from our country. In India as much as 55% of the land is cultivable.



Fig. 6 Cattle rearing in the grasslands

There is an acute shortage of land in Holland. The people of Holland (the Dutch) have reclaimed small portions of land from the sea by building embankments called dykes to push back the sea. The land that is reclaimed is called '*polder*'.

In eastern and northern Europe, it is not possible to cultivate the land in winter due to the extreme cold. Snow that covers the land for almost six-months begins to melt only in spring leaving very little time for crops to mature. It is in spring that sowing takes place and crops mature in the summer months and are ready for harvest in autumn. As a result it is possible to raise only one crop in a year in these parts. However, in southern Europe it is possible to raise two crops a year.

- Can you reason why it is possible to raise two crops in the Mediterranean countries?

Wheat is the main crop of European plains. It is grown extensively in France, Germany, Russia, Ukraine, Poland, Italy, Greece, etc. We have seen that fruit cultivation is prominent in southern Europe. Fruits like grapes are used for making wine. The Mediterranean countries like Portugal, Spain, Italy and southern France are famous for their wines.

Barley, oats, rye, sugar-beet, potato, etc. are also important crops of Europe. Sugar is manufactured from beet in Russia, Ukraine and Germany.

DISCOVERY OF SEA ROUTES

No part of western Europe is too far from the ocean. In contrast many countries of Asia are thousands of kilometers from the sea.

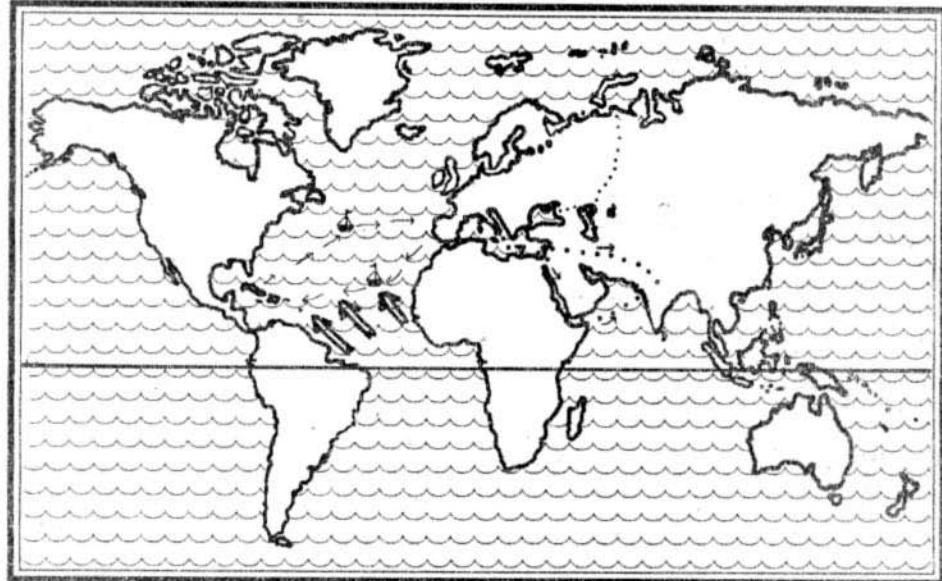
- Look at the wall map or atlas to identify the names of at least six cities of Europe which are situated on the sea coast.

There are thousands of such seaside settlements where seafaring people have been living for hundreds of years. With centuries of experience of sea travel the European sailors were famed for their skill and courage on the seas. They were also skilled in building boats and ships. Initially they were built for fishing in deep seas. Gradually besides being used for fishing, ships began to be used for international trade.

From the very ancient times the people of Europe have been trading with India and other countries of Asia like Indonesia and China. From these countries Europe obtained many things like cotton and silk cloth, gems,

Map 7 Trade Routes

- Index
- Route of Columbus →
 - Trade winds ↗
 - Old Land route to India



ivory and spices such as cloves, pepper, and cinnamon – that were not available in Europe. The Europeans got these in exchange for gold and silver, which they brought from Europe. Do you know what route they took from Europe to India? Look at map 7 in which two major routes are given. Both the routes crossed the Mediterranean Sea and then while one of them took a land route via the Middle East, Iran, and Afghanistan, the other route took a sea route via the Red Sea and the Arabian Sea.

About five hundred years ago the West European sailors and traders began to search for new routes to India. This was because both the routes mentioned above passed through countries ruled by the Arabs who were often at war with the Europeans. Further, most of the trade in the Mediterranean Sea was controlled by Italian merchants who did not let traders of other countries in easily. That is why the sailors of the other countries began to look for routes to India which did not have to pass through the Mediterranean Sea or the Arab ruled countries.

- *Looking at the map can you tell what the new route could be?*

Of course these maps did not exist in those days and people had just begun to figure out that the earth must be round and not flat. An Italian sailor named Christopher Columbus thought, ‘If the earth is round then it should be possible to reach India from the west too. If we were to travel westward across the Atlantic Ocean we would reach China and India sooner or later.’

- *Look at a globe to check whether Columbus’s thinking was correct.*

Columbus set out with three ships in 1498 to cross the Atlantic Ocean. After three months of sailing he saw land ahead. Columbus thought that he had reached India. Actually he was still far from India; he had reached what we now call the West Indies. These are a group of islands near America. In fact Europeans before

Columbus did not know of America. In a way he ‘stumbled’ onto America. Soon Europeans realised that Columbus had not reached India but a new unknown continent. After that several Europeans went to America to trade, conquer and settle.

The ships of those times had sails to harness wind-power. They sailed with ease with the winds blowing westwards towards America. Which were these winds blowing westwards taking ships from Europe to America? Were these the Westerlies? No, these were not the Westerlies, which blew towards Europe. These were different winds, which blew from the south of Europe towards the south-west direction. They blew throughout the year and took ships from south-west Europe to the east coast of America. These winds are called ‘Trade Winds’.

While the Westerlies blow from the south-west to the north-east, the Trade Winds blow from the north-east to the south-west. In other words the two winds blow in opposite directions all through the year. (Both these winds are shown on Map 7.) This helped Europeans to travel to and from America easily. They could go to America using the Trade Winds.

- *Look at Map 7 and answer the following questions:*
- *Which winds would help the sailors to return to Europe from America?*
- *Could the sail driven ships use the Trade Winds to return to Europe? Give reasons for your answer.*

After Columbus the Europeans discovered several sea routes. They could now sail not only to America but also to different parts of Africa, India and Australia. They traded with these countries and amassed immense wealth, which was used to develop industries in Europe. You will read about this in the next lesson.

EXERCISE

1. The Atlantic Ocean has had a deep impact on the climate of Europe as well as on the life and livelihood of the people of Europe. Collect all the references regarding how this ocean affects the climate of Europe and the life of the Europeans and write an essay on the theme.

2. Answer these questions with the help of the maps given in the lesson:

Which of the following is not a landlocked (surrounded by land) country – (Hungary / Romania / Poland / Switzerland).

Which mountains lie between the Caspian Sea and the Black Sea – (Alps / Caucasus Mountains)

Which countries are on the shores of the Arctic Ocean – (Russia / Germany / Sweden / Norway).

Can a ship sail from the Black Sea to the Atlantic Ocean? If yes, trace the route it will have to take.

3. Fill in the blanks:

Land which is surrounded on all four sides by water is called

Land which is surrounded by water on three sides is called

An inlet of a sea which is surrounded on three sides by land is called

4. Why are harbours built in deep gulfs or bays?

5. Why are the winters less severe in western Europe than in eastern Europe?

6. Name four countries on the coast of the Black Sea.

7. How do the Westerlies benefit the people of western Europe?

8. What are the characteristics of the Mediterranean climate? Name the countries which have a Mediterranean climate.

9. In which part of Europe will you find coniferous forests?

10. Give the forest type against the trees in the following table:

Tree	Forest
Olive	
Pine	
Oak	
Spruce	
Maple	

11. What are the factors that limit European agriculture?

12. Name the important crops of southern Europe.

CHAPTER 7

THE DEVELOPMENT OF EUROPE

Today European countries are known for their industrial development and their industrial products like cars, airplanes, ships, machines, electrical equipment, textile, etc. These industrial products of Europe are sold all over the world. Europe owes its power and prosperity to its industries. However, just two or three centuries ago industries had not developed in Europe.

A process of change swept Europe after 1700, which resulted in rapid industrial development. These changes began in England and eventually spread to all the other European countries. In this chapter we shall read about some aspects of this process.

Changes in Rural Life

Before 1500, most people in Europe lived in villages and cultivated land. Most of the land was owned by big landlords. The peasants cultivated their lands and gave the landlords a large part of their produce as rent.

- *Does a similar situation prevail in your region even today?*

In the period between 1500 and 1600 (the 16th century) trade between countries began to increase rapidly. The landlords of England thought that they should take over all the lands, produce and sell grain themselves, and profit from the increased trade. They began to throw out the peasants from their lands. These peasants began to wander in search of a living. In this way large farms were formed in which a new kind of agriculture was practiced using different kinds of machines. As a result production increased but the small peasants were deprived of their livelihood.

- *What could the small peasants have done for a living?*
- *How do you think the landlords managed without peasants to work on the land?*

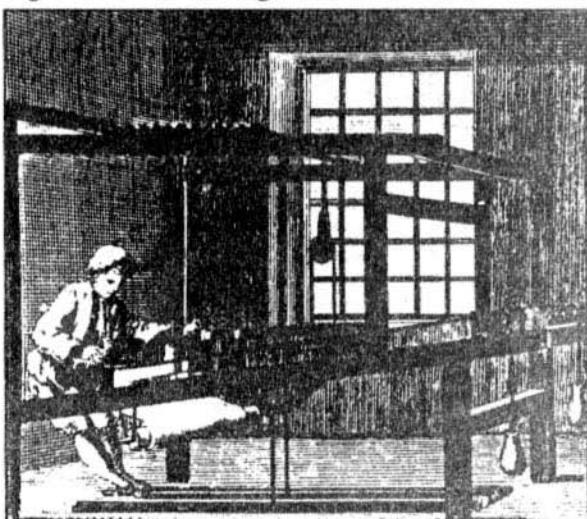
- *Discuss the problems being faced by small peasants and landless labourers in your region.*

Along with changes in farming, important changes were also taking place in craft production.

Changes in Craft Production

Before the 17th century, craftsmen living in villages and towns made things at home with their own hands and sold them in the local market. All members of their family

Fig. 1 A weaver weaving on his handloom at his home



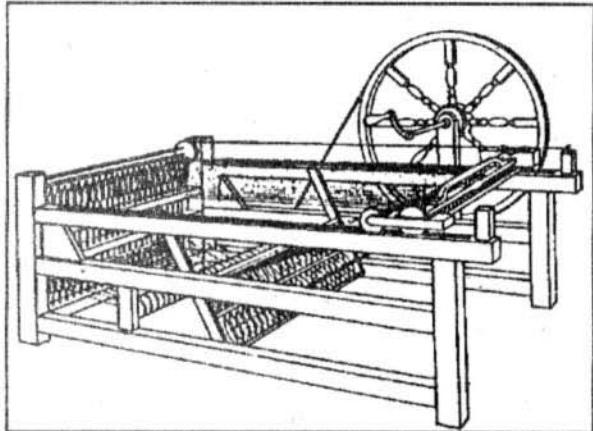


Fig.2 'Spinning Jenny' - A new machine to spin yarn

participated in this production in one way or the other. For example in cloth production, women spun yarn and dyed it while the men wove cloth and sold it in the market. As trade increased changes began to affect the artisans too.

After 1600, some weavers began thinking, 'These days there is a great demand for our cloth. But we are not able to produce more cloth to meet this demand. Besides, the cloth made with our looms is expensive. If we can make machines which can spin yarn faster and weave cloth faster, we will be able to produce more cloth at a lower price. Then more people will want to buy and we can sell more and earn more money.'

As a result of the pressure of trade and work several people attempted making such machines. Then came the long awaited invention - a machine which could spin lots of yarn in a short time (Fig. 2). However, these machines were very heavy and the artisans thought, 'It is so tiring to turn these machines with our hands or feet. How nice it would be if the machines could turn by themselves.' This dream also came true with the famous invention of James Watt - the steam engine.

James Watt's Invention

James Watt was an English craftsman who made machines. He noticed that steam had so much strength that it could move enormous weights. With this in mind he made a machine

which would run with the help of steam and did not need to be driven by men or animals.

He showed his invention to an industrialist called Boulton and the two entered into a partnership to make such machines. Boulton invested the necessary money and also paid Watt a salary. Watt made the steam engine. The understanding between them was that if they made profit then two thirds of it would be Boulton's and one third would be Watt's. The two together made a large number of steam engines and sold them and made huge profits.

Once it became clear that machines could be made to run on steam, then, such machines came to be made for all kinds of work – spinning, weaving, making iron tools, driving vehicles and ships, etc.

• How did the need for self-driven machines emerge in England?

DEMAND FOR IRON AND COAL

The use of machines became common in England. However, there was a great need for good quality steel and coal to make and drive these machines. The methods by which iron ore was made into steel were very expensive.

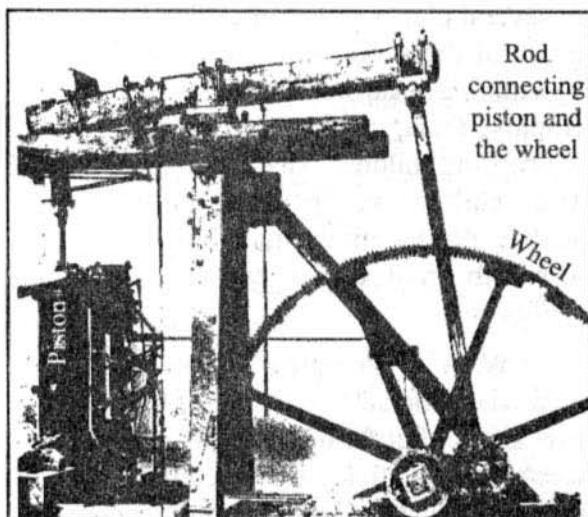


Fig. 3 This is one of the steam engines made by James Watt. The piston under pressure from the steam pushes the rod up and down which turns the wheel

Yet, the steel that was made in those days was not strong enough. So the scientists, artisans and industrialists of England began to search for methods for making good steel. Many new methods were invented. The most important were:

1. The use of coal instead of wood or charcoal in the furnace for smelting iron ore. Coal was cheap. Besides, it also generated more heat in the furnace. However, it had to be mined from the earth.
2. The use of steam engine to blow air into the furnace to increase the temperature and reduce the time taken and improve the quality of steel.

The use of coal made it possible to produce good quality steel at low costs. It was also used to heat water for steam engines.

- *The use of coal in industry increased manifold during this period. Can you read the above section once more and list the reasons for this?*

Coal Mines and Industrial Centres

As the demand for coal increased, there were extensive surveys to identify coal deposits. Large coal deposits were discovered in several places. A list of coal belts has been given in the accompanying table. Extensive coal mining began in these places. Mine owners employed a large number of people including women and children to haul coal to the surface. These children were paid half the wages of the adult workers. Thus the mine-owners were able to sell the coal quite cheap and amass huge profits.

With growing mining and industrialization the landscape of Europe began to change. After the discovery of coal deposits, forests and lush fields in vast regions gave place to large coal mines, settlements of miners and small industrial centres. To begin with, the iron and steel industry developed around coal mines. This was because it took twice as much coal to

Coal Producing Areas of Europe

Germany –	Ruhr-Westphelia region and Zhar region
Poland –	Upper Silesia
Britain –	Yorkshire, Oxfordshire, central Appenine mountain region
Ukraine –	Donets river basin
Russia –	Moscow-Tula region
Hungary –	Pax and Comolo region

make steel as it did iron. It was, therefore, cheaper to transport iron ore to the coal mines than to transport coal to the iron ore mining regions. Thus coal mine areas also became centres of steel production.

Several other industries like machine making, textiles, etc. also began to develop in that area due to the easy availability of steel and coal. Thus large industrial cities began to develop around coal mines.

- *List the countries with major coal deposits in Europe using map 1.*
- *Mark the following statements true or false:*

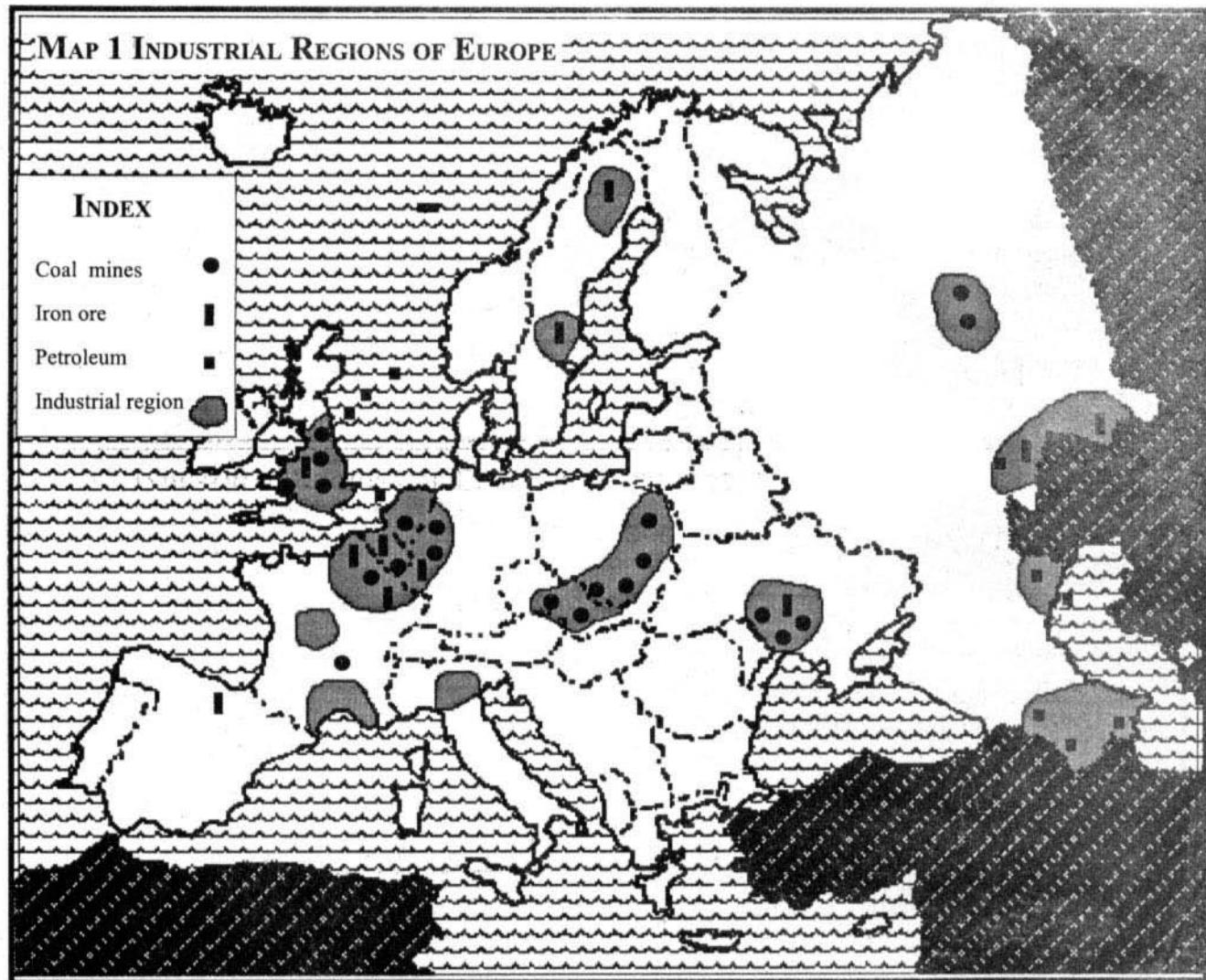
Coal is found in Portugal.

Industrial regions can be found wherever there are coal mines.

Spain is part of a large industrial zone.

Wherever there are industrial zones we find coal mines too.

The process of industrialisation of Europe, which began 200 years ago, has now reached full development. A large majority of Europeans now work in industries and live in cities. Even agriculture is done largely with the help of machines and very few people work on the fields.

MAP 1 INDUSTRIAL REGIONS OF EUROPE

TRADE IN INDUSTRIAL PRODUCTS

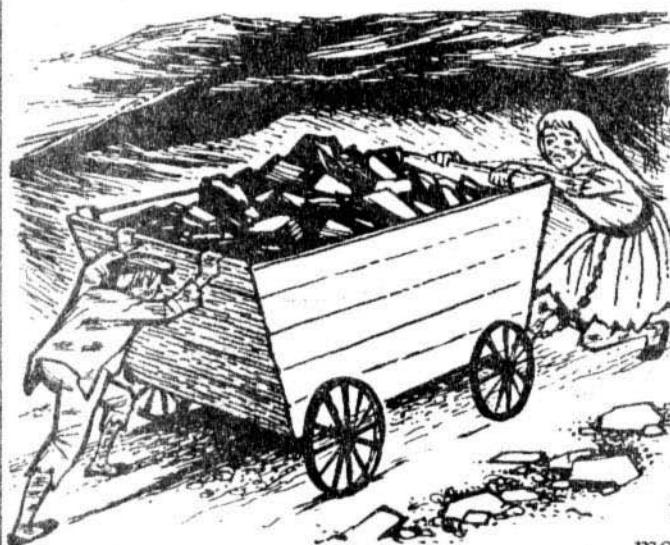
Industrial production increased so much that it was not possible to sell all the products in their own countries. The factory owners began to sell them in other countries, too. Machine made goods were cheap and durable. Hence the demand for them increased all over the world. This gave a boost to the industries in England and other countries. However, what is interesting is that these countries did not have the raw materials required for production of these goods. For example, the cotton needed for producing cloth was grown in India and America. English traders purchased these raw

materials from India and other countries and sold them to the factory owners. Subsequently the traders purchased the finished products and sold them in India, America, etc.

In order to serve the interests of their trade and industry the Europeans sought to subjugate these countries. Besides England, now France, Germany, Spain, Portugal, Belgium, Holland, and others conquered colonies for themselves in Asia, Africa, Australia and America. ('Colonies' are those countries whose resources are used for the benefit of another country). You will read more about this next year. These European countries

THE EXPERIENCE OF A 19TH CENTURY CHILD-WORKER

In the 19th century the industrial workers of Europe had to face severe hardships. Let us read about the experience of a child employed in an English coal mine:



"I have been working in these mines since I was four. Workers hew coal with pickaxes and fill the large wagons with it. Our job is to push these loaded wagons to a point from where horses or mules can haul them. This is a very difficult job. Hauling the loaded wagons through water and slush and over very steep slopes leaves us very tired. We have to work in this way for more than 12 hours a day. We are so tired by the time we return home that we collapse in our beds and sleep... We don't even feel like eating. Yesterday I fell asleep on the way to my house. My mother searched for me and carried me home."

There were several movements to stop employing children in this manner in factories and mines. In response to these movements child labour was banned and now it is a thing of the past in most European countries.

Inside Early Factories

Major changes swept industries with the coming of machines. Machines could be worked by even unskilled persons. Thus skilled artisans were no longer required. In their place a large number of women and children were employed and made to work for meagre wages.

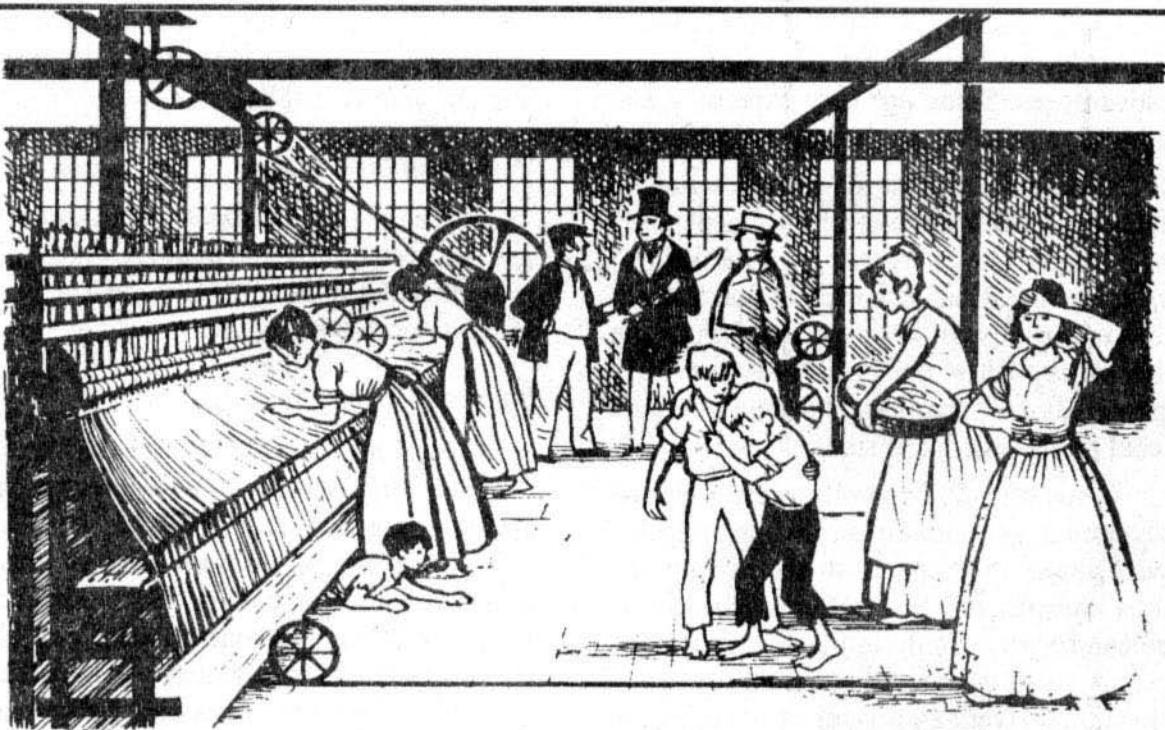
Machines cost a lot of money, and ordinary artisans could not afford them. Only wealthy merchants could set up mechanised factories.

This is what the workers had to say about their plight:

"Every day we come for work at 6 a.m. and work till 8.30 p.m. There is a lunch break of only an hour. By the end of the day we are so tired that we cannot work. Then the factory owner uses whips to goad us to keep working."

"These days new machines are being introduced constantly. These machines can do the work of several workers at the same time and therefore fewer workers are required. Everytime a new machine is introduced many of us are thrown into the street."

Most of these workers had no other option as they had been expelled from their lands and if they were small craftsmen their shops had closed down. Gradually, workers of factories and mines formed their own organizations to fight against the conditions of work. In the beginning they demanded 10 or 8 hour working day, higher wages, disallowing children



under 14 years of age from being employed in mines or factories, etc. Over time, their struggles were successful and the conditions of the workers improved.

- *Who were employed to work on the machines?*
- *Do you know of any factory nearby? Compare the conditions of work of that factory with that of English factories 150 years ago.*
- *Compare the conditions of the workers of the leather tannery with that of the English workers 150 years ago and find out the similarities and differences.*

Today, children are not employed in factories or mines in most European countries. The working hours have also reduced greatly; they now work for only 6 to 8 hours for five days a week. They also get sufficient wages to live in comfort. However, even today the problem of unemployment persists. Ten out of every hundred persons in Britain are unemployed. They get an unemployment allowance from the government.

exploited the colonies in other continents and grew wealthy in the process.

- *The industrialists of Europe purchased their from other countries and sold their in those countries.*
- *The cotton for England's textile mills came from and*
- *What impact would this trade have had on the artisans of countries like India?*

SOURCES OF ENERGY AND INDUSTRIAL DEVELOPMENT

You have seen that energy is needed to run the machines in a factory. Energy is available from coal, electricity, petroleum, etc. Initially industries depended upon energy from coal and steam. Subsequently, several other sources of energy like thermal and hydro electricity, petroleum, natural gas, nuclear

energy, solar energy, etc. have been harnessed. Each of these have their advantages and disadvantages. Some are very expensive and others harmful to the environment.

Nowadays almost all factories run on electricity. How are the electricity generators run? Initially they were run with the help of *thermal power*. Coal was used to make steam and steam power was used to run the generators. This method was not only expensive but also harmful to the environment as coal produces a lot of smoke.

Generators also run on waterpower and the electricity produced in this manner is called '*hydel power*'. Compared to thermal power, this is cheaper and less polluting. However, they can be set up only in places which have perennial rivers or waterfalls. Europe has plenty of perennial rivers as it rains all through the year. Melting snow also keeps the rivers flowing in the summers.

Today, in many countries of Europe, hydel-power is the main source of electricity. For example, almost the entire power requirement of Norway is fulfilled with hydel-power. You have read about the snow covered Alps in Central Europe. A large number of perennial streams and rivers start from the Alps. That is why countries situated in the Alpine valleys, like - Austria, Switzerland, Italy,

Germany, etc. generate most of their electricity from hydel-power plants fed by perennial streams and waterfalls.

Petroleum and Gas

A large reserve of petroleum and natural gas has been discovered in the North Sea. This provides countries like Britain and Norway fuel to run their power houses.

Nuclear Energy

Even nuclear power has been harnessed for generating electricity. Several countries like Britain, France, Russia, Ukraine, etc. have a large number of nuclear power houses. However, nuclear energy can be extremely harmful to the environment and can cause serious diseases and genetic deformities in people, animals and plants of the surrounding area. Sometimes radioactive materials leak from these power houses and kill a large number of people.

Since most sources of energy which we use are either environmentally harmful or are not likely to last forever, scientists and engineers have been trying to harness new sources of energy like solar, wind and tidal power. These are non-polluting and are likely to last forever. In contrast, the reserves of petroleum, gas or coal are limited and are likely

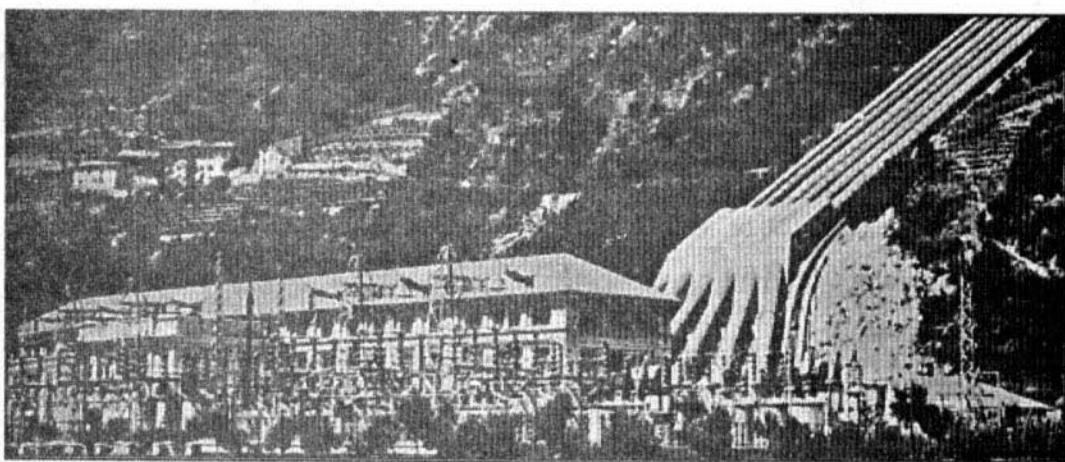


Fig. 4 A hydroelectric plant in northern Italy situated on the slopes of the Alps. Water is brought down the slopes in large pipes to the powerhouse. The waters descend with a force that turn the turbines of the generators.

to be exhausted sooner or later. However, till today the cost of harnessing these new sources of energy are very high and we have to wait till cheaper methods are invented.

European countries have made great progress in electricity generation and this has formed the basis of their industrial development.

- You have read about different sources of energy, which can be used to make electricity. Each of them has its advantages and disadvantages. Discuss in your class which method would be most suited to your district.*

Iron and Steel Industry

The metal industries are very important in Europe. Deposits of good quality iron ore are available in many places in Britain, France, Germany, Norway, Sweden, etc. Several other metals like manganese, cobalt and nickel are also needed for making steel. These are available in countries like Russia, France and Germany. That is why these countries are in the forefront of steel manufacturing in the world. Steel is used extensively in ship building, automobiles, aeronautic industries and also in heavy machinery. Today Europe accounts for nearly half of the world's steel production and is in the forefront of machine building industries.

It should be noted that today industries are no longer concentrated around coal mines. As new sources of energy have been harnessed it is no longer necessary to be near sources of coal. In fact the industries have shifted to ports and harbours to use sea transport easily. In this manner new industrial centres have developed.

Petrochemical Industries

Over the last 50 years the use of chemical fertilisers in agriculture has increased manifold all over the world. Besides this, the use of petroleum products has increased on a great scale. We get a very wide range of things from



Fig.5 A factory which produces chemicals from petroleum

petroleum. Besides diesel, petrol and aviation fuel we also manufacture chemical fertilisers (like urea), plastic, artificial rubber, dyes, pesticides, polyester and artificial woolen yarn, etc. after refining crude petroleum.

All this has contributed to the massive expansion of chemical industries after the 1950s. These industries use coal, petroleum, sulphur and different kinds of salts. Several European countries like Germany, France, Russia and Britain have developed chemical industries.

The petrochemical industry is concentrated in oil producing regions of Britain, Holland, Ukraine and Russia. Countries like France, Germany and Italy, which do not produce oil, import oil from other countries for their chemical industries. All these countries are important exporters of goods like chemical fertilisers, plastic, polyester, etc.

- Look at map 1 and name three countries which produce petroleum.*
- Which of these countries have a large chemical industry-*

Spain

Hungary

Italy

Germany

Britain

Russia

DECLINE OF OLD INDUSTRIES AND RISE OF NEW INDUSTRIES

These days even underdeveloped countries have industries of their own. As a result, the demand for European goods has declined. At the beginning of the previous century, the cloth produced in Birmingham was sold all over the world, especially in countries like India. Today the textile industry of our country is so developed that we are currently

the largest producers of cloth in the world. As a result of changes like this, the demand for British cloth has declined and this has led to a decline of the textile industry in Britain. Textile mills of Birmingham have closed down and this region is now called the 'graveyard of textile mills'. Heavy machinery industries have replaced the textile mills in Birmingham.

In the following lesson we shall read about France, a very important country of western Europe.

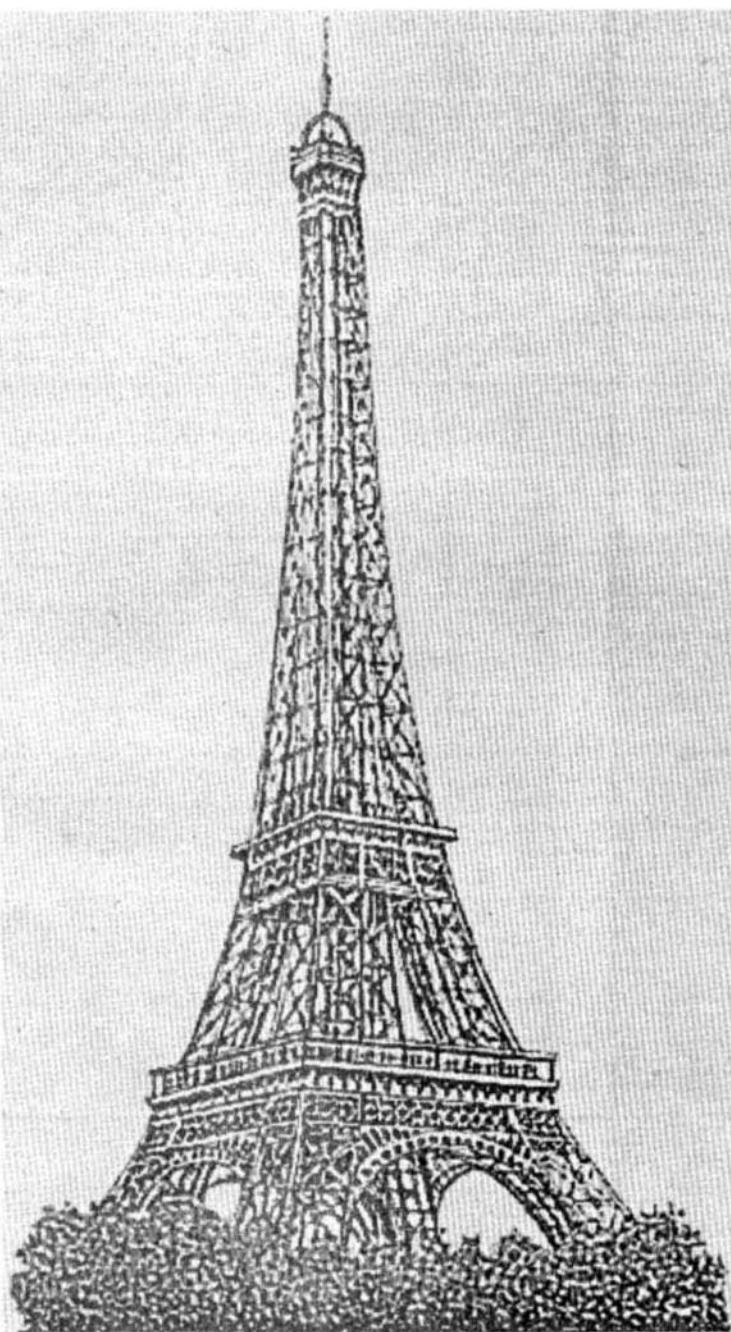
EXERCISE

1. Why were new machines invented in England?
2. Why did coal and steel assume importance in the early stages of industrialisation?
3. How did the traders of Europe get the resources to set up factories?
4. How did the establishment of factories affect the old artisans?
5. How did the introduction of new machines affect factory workers?
6. Why did people of other countries begin to purchase the products of British factories?
7. Why did Europeans establish their rule over other countries?
8. Where were the early factories established ? Why do you think factories are being established in different areas today?
9. Why did the sailors of Europe set out in search of new countries and sea routes?
10. Name the countries which are important producers of iron and steel in Europe.

CHAPTER 8

FRANCE

France is a large country in Western Europe. Its capital, Paris, is known the world over for its beauty. The broad roads with flowerbeds on both sides, rows of trees, fountains, colourful lights and beautiful statues at the road junctions are worth seeing. Paris is spread on either banks of the Seine River. You can see the whole of Paris from the Eiffel Tower, built of steel in 1889. It was erected to celebrate the hundredth anniversary of the great French Revolution which ushered in the modern era of democracy. The people of France overthrew the monarchy and sought to establish the principles of Liberty, Equality and Brotherhood of all people.



The French are also famous for their trendsetting fashion designing and very delicious food preparations. This is because France is a land of great diversities as it extends from the Alps to the Atlantic and from the cold north to the warm Mediterranean.

Can you look at the map of Europe and find out the location of France?

Name the oceans and seas surrounding France. In what way do you think France would benefit from them? Can you remember the discussion in the chapter on Europe and answer this question?

France also shares boundaries with several countries. Name these countries with the help of the map of Europe.

Fig. 1 The Eiffel Tower

MAP 1 PHYSICAL FEATURES OF FRANCE

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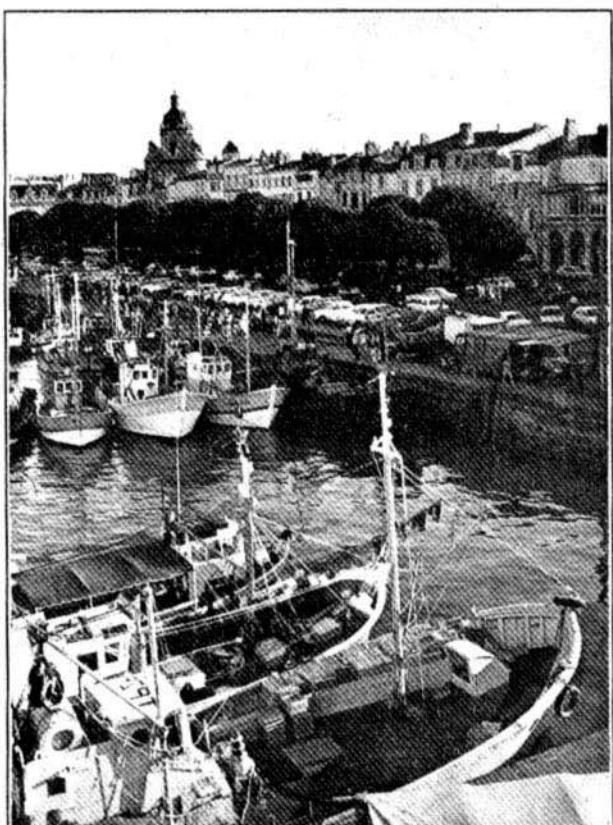
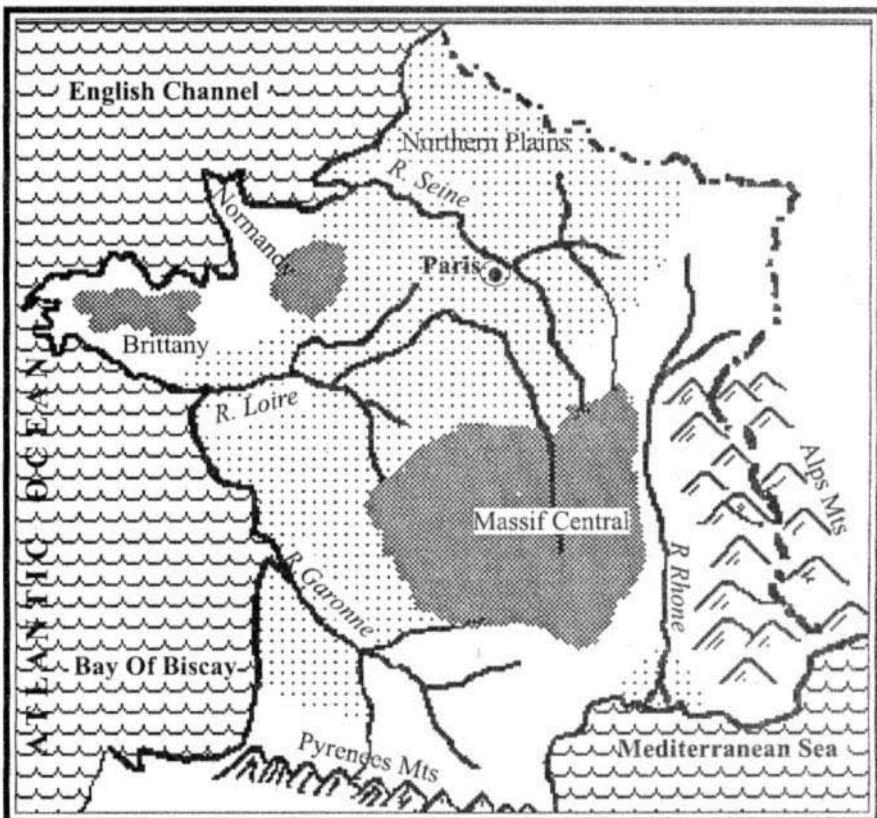
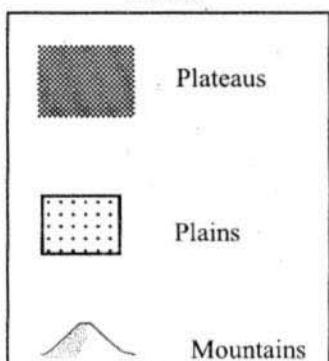


Fig. 2 View of a French harbour. Ships have anchored in the harbour. There are many such ports along the coast of France. What could the ships be used for?

MOUNTAINS, PLAINS AND PLATEAUS

- Take a look at the natural features of France in Map 1. You will notice that the northern and the western parts have broad plains. Name the rivers flowing through these plains.
- Look for mountains on the eastern and southern side of France, and write down their names.
- There is a large plateau situated in central France called the Massif Central.
- Which of these regions is likely to be the main agricultural region of France?
- Which of these regions do you expect to be the main animal rearing regions? Why do you think such regions may not be suited to agriculture?
- Which of these regions do you think would be industrially developed?

CLIMATE

You know that Europe is not as warm as our country and that it has long and severe winters. However, France, being on the west of the continent, does not experience as severe winters as countries like Poland and Russia in Eastern Europe. Having read about the climate of Western Europe you can understand what the reason for this difference is.

Due to the moist Westerlies, which blow throughout the year, France gets showers all round the year. There is bright sunshine during a part of the day and before long the clouds gather and pour rain. Soon enough the sky clears up and there is sunshine again. Though it rains throughout the year it rains more in the winter. Occasionally it also snows in winters. Since the air is cool, the rainwater does not dry up quickly and moisture remains in the air.

You may remember that it also rains throughout the year on the Equator, as in Indonesia. In France it does not rain like it does in Indonesia. While in Indonesia it rains heavily everyday, France only has gentle showers daily.

- **Mention two differences between the climate of France and the climate of your state.**

The Four Seasons and Agriculture

In our country we have three seasons, winter, summer and the rains. However, most European countries including France have four main seasons. These are winter, spring, summer and autumn. The look of the land changes according to the season and the agricultural routine changes, too. The transformation of a place over these seasons can be seen in the pictures given overleaf.

Winter: As November approaches, it begins to get chilly. December onwards, it gets very cold and snow begins to fall once in a while. It snows heavily on the mountains and less on the plains. It drizzles continuously as the clouds keep coming. The sun shines once

in a while. The sun rises very late in the day, at about nine or ten o 'clock and sets by four o 'clock in the afternoon. The overcast sky makes it even darker.

France has broad-leaved trees, which shed their leaves in winter and stand entirely leafless.

Due to excessive cold the domestic animals cannot be kept outdoors. They are kept in stalls and have to be fed there. That is why the farmers have to collect hay and other animal feed for use in winter. The animals have to stay indoors due to snowfall. Due to the intense cold and snowfall crops do not grow and the fields lie fallow during winter.

- *Farmers in our country too store fodder. Do you know in which season this stored fodder is used?*
- *Do fields lie vacant in winter in our country, too?*
- *What crops grow in winter in our country and why do they not grow in the same season in France?*

Spring: The landscape begins to change as March comes. The days get longer and the nights shorter. There are fewer clouds and more sunshine. The snow begins to melt and new shoots appear on trees. Fresh green leaves appear and colourful flowers bloom everywhere. Lush green grass begins to grow on the pastures.

The fields are ploughed in spring and sowing is also done during this season. Wheat, rye, barley, corn, beetroot and oats are the principal crops.

- *Which of these crops grow in your state?*

Wheat is the most important crop of France. In those parts of France where it does not snow much, wheat is sown before the onset of winter. The young plants remain stunted in winter as snow falls and melts. They however, grow very fast with the coming of spring. The



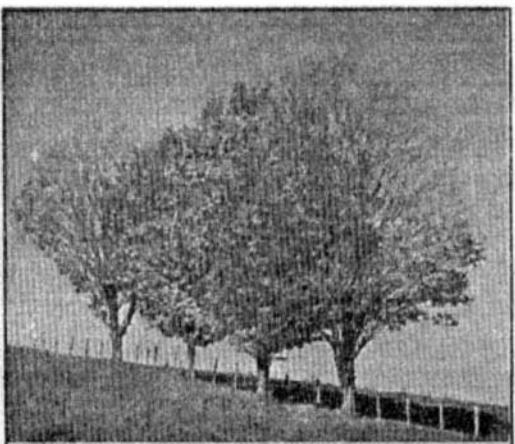
A. In Winter



B. In Spring



C. In Summer



D. In Autumn

Fig. 3 Look carefully at the pictures of the four trees above. They belong to different seasons. Can you identify the important differences in them?

productivity of such wheat crop is very high.

Another important crop is rye, a cereal with longish grains. It is used for making bread and also fed to animals. It is also used for brewing beer. Though sugarcane does not grow in French climate, sugarbeet does. Sugarbeet is used for making sugar. Its waste material is fed to animals. All these crops are sown in spring and they mature in summer.

Summer: It is summer in France from June to August. It does not rain so much and there is more sunshine. The days are longer – longer than even in our country. The sun rises as early as four o'clock in the morning and sets after eight o'clock in the evening. Nevertheless,

it does not get very warm. The French summers are only as warm as our winters!

Summer is the season of agricultural work in France. Crops mature in this season. There is no need for irrigation as the occasional showers are sufficient for the crops. At the end of summer the crops are ready to be harvested. It is in summer that the grapes are harvested, too. Grapes are one of the most important crops of eastern and southern France. Grapevines are grown in vineyards. New leaves and flowers come in early summer and the grapes ripen by the end of summer. France grows a number of varieties of grapes. These are mostly used for making wine. Juice is pressed out of the grapes

and it is fermented to get wine. French wines are famous all over the world.

In our country we have two agricultural seasons, *rabi* and *kharif* (winter and monsoon). Thus it is possible to grow crops for nearly eight to ten months in a year. On the other hand, in France and other European countries, cultivation is possible only for six to seven months.

Autumn: The climate changes once again in September and October. Tree leaves turn red and yellow and begin to fall. Agricultural operations are wound up. Hay is cut and dried for feeding farm animals in winter. Grapes and other fruits are plucked and used for making wine, jams and juices of various kinds and preserved in other ways.

- *The four main seasons of France are*
1 2 3 4
- *is the main agricultural season in France.*
- *are important crops of southern France.*

Fruits

Besides grapes, France also grows strawberries, cherries, apricots, plums, peaches and apples. These fruits are grown in plenty in orchards. They present a beautiful sight with their riot of colourful flowers in spring. They are harvested in late summer.

These fruits are also grown in orchards in our country near Nainital and Shimla on the Himalayas. Here the fruits ripen in May – June. These fruits are generally grown only in cold climates. In warmer climates, as in our state, we grow mangoes, banana, guavas, etc. These fruits do not grow in cold countries like France.

• *Why do you think fruits that grow in France also grow in the Himalayas?*

Southern France is warmer in comparison to the north. Hence some crops which do not grow in the north grow well here. Olives are grown in plenty in the south, especially near the coast. This tree grows well on stony slopes. In fact no other crop can be grown on such land. Oil is extracted from olives and is used as a cooking medium. Lemon, tangerine and oranges are grown extensively in the south and these are used for preparing squashes and jams.

Animal Rearing and Fodder Crops

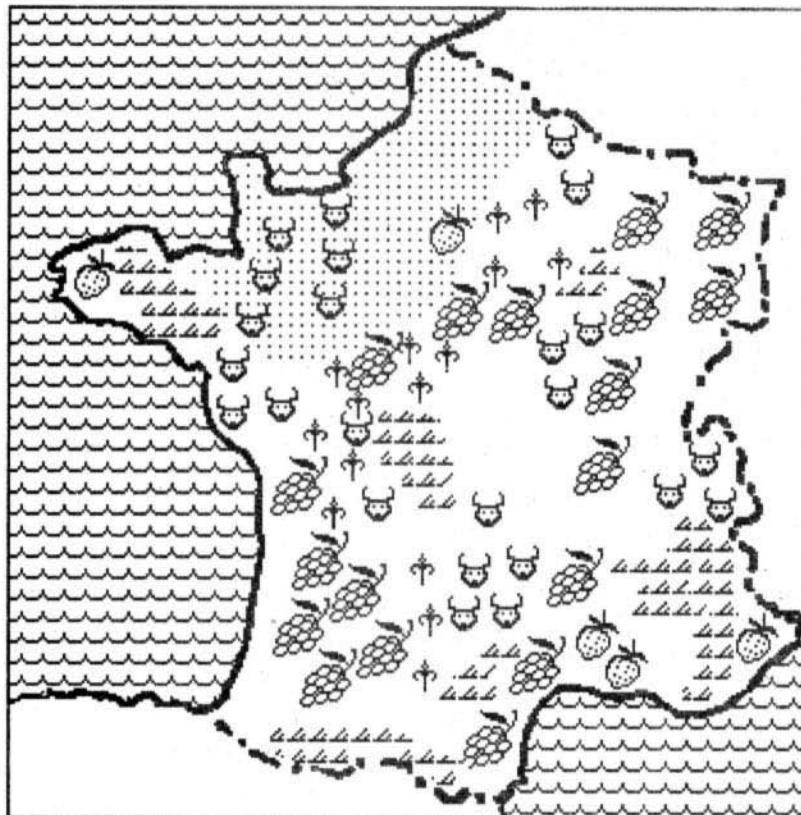
Animal husbandry is an important part of French agriculture. Unlike in our country animals are no longer used for working on the field or pulling carts. More than a hundred years ago animals like horses were used for tilling the land but today all farming operations are mechanised.

Milk, butter, cheese and meat are important ingredients of French food. Cattle are reared for their dairy products. Milk is made into cheese, which sets in large blocks like

Fig. 4 Harvesting grapes



MAP 2 CROPS OF FRANCE



Index

	Pasturelands
	Wheat
	Rye
	Dairy
	Grapes
	Other Fruits

jaggery (*gur*). Cheese is an important part of French cuisine. The French also consume large quantities of milk, cream and butter. Pigs and cattle are also reared for their meat. There are different breeds of cattle for milk and meat. Sheep and goats are reared in the plateau and mountainous regions. They are reared for wool and meat.

You have just read that the grasses are short and juicy in cool and wet climates. Hence the grasses that grow in France too are short and juicy and cattle and sheep graze on them. However, the animal husbandry of France does not rely on them alone and a number of fodder crops are grown and the waste materials of a number of industries are used to feed the farm animals. Crops like clover, cabbage, oats, turnip, corn and barley are fed to the animals. The waste material obtained after extracting sugar from beetroot is also fed to farm animals.

- *How is the climate of France suitable for animal husbandry?*

French Farms

Most of the cultivation in France is carried on in large farms, most of them being more than 50 to 100 acres in size. Generally farmers build their houses in their own farms. This facilitates farm work. That is why there are no large villages in France. The farmhouses are usually very large and have a number of rooms for different purposes. Sheds for animals, godowns for storing grains, coops and sties for poultry and pigs are part of the farm.

These big farmers hire labourers to work on their fields. They also use heavy machines like tractors and harvesters. Almost the entire product is sold in the market. Sometimes the farmers also hire machines from nearby cooperative societies.

- *Find out the average size of a farmer's land in your area.*
- *Do farmers in your area too hire tractors and harvesters?*

Large holdings and mechanised farming enable French farmers to earn a good income. They live in comfortable houses equipped with modern amenities. They use gas and electric stoves for cooking. About fifty years ago most French farmers baked their own bread. Now they sell off most of their produce and buy their bread from the market daily. A very large variety of breads and cakes are available in nearby towns. Fresh meat, which is an essential part of French diet, is obtained from poultry, cattle and pigs of the farm. Meat is also preserved by smoking, drying or freezing. All houses used to have larders or cellars where meat, cheese, and wine were stored. These are also now stored in large refrigerators.

The farmers obtain most of their requirements from the nearby town. Besides bread and other food items, they also obtain agricultural tools and machines from nearby towns. Their children too go to schools in the towns. According to the French law it is compulsory for all children to attend schools run by the government. Thus all children in France have the opportunity to get educated.

Modern Agriculture

In France, as in other countries of Europe, agriculture is practised as a commercial enterprise, just as any industry. The farmer makes his living by selling his entire produce and getting all of his requirements from the market. The agricultural technology they use also requires the use of hybrid seeds, chemical fertilisers, pesticides, etc. Most agricultural operations are mechanised. In our country such modern techniques of cultivation were introduced as a part of the 'Green Revolution' in the 1960s. You may have read of the pros and cons of this in class 6. France has also undergone another revolution called 'White Revolution'. The objective of this revolution has been to improve dairy production. There have been efforts to improve breeds of cattle and improve fodder and cattle feed. This has resulted in increased yields of milk.

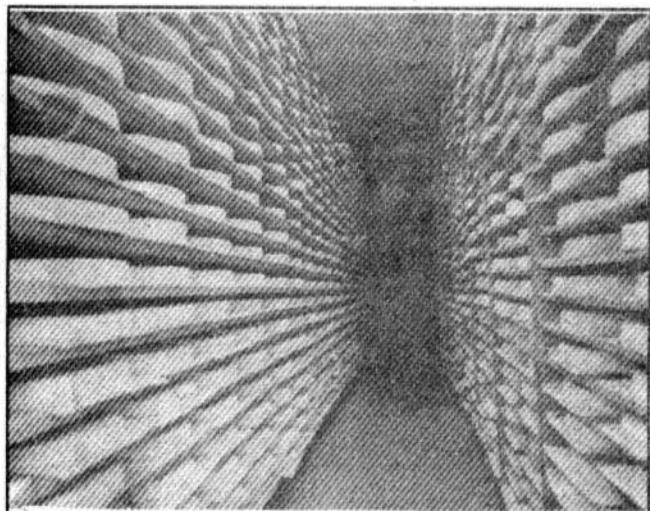


Fig. 5 Cheese stored in cellars

- *Do you know of similar efforts in our country to increase milk production?*

MINERALS AND INDUSTRIES

- *Look at Map 2 and find out what minerals are mined in France.*

Unlike Germany or Britain, France does not have very large deposits of minerals. Nevertheless, coal and iron ore are available. You have read in the previous chapter that the availability of coal and iron in close proximity helps in the development of iron and steel industry. France has a developed steel industry, which has enabled her to develop machine and tool industries. France is especially famous for its aviation (aircraft) industry. France has also developed several other industries. Look at Map 2 to find out the kinds of goods France produces and look at the location of those industries. In recent years mining of minerals like coal has declined as France finds it cheaper to import coal from South Africa and the US.

- *Look at Map 2 and answer the following questions:*
 - *Are industries located all over France, or are they concentrated in some regions?*
 - *Must regions with mineral wealth also have developed industries?*

MAP 3 INDUSTRIES OF FRANCE



INDEX

● City	■ Coal	▲ Iron	◆ Aluminium	○ Machine	■ Steel	● Chemicals	◆ Leather	● Vehicles	★ Perfume	○ Rubber products	● Aeroplane	★ Plastic	● Steel products	● Watch	● Electrical goods	● Glass products	● Chinaware	● Rail	● Woolen cloth	● Cotton cloth	● Silk cloth	● Clothing
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North-Eastern France

France is also famous for its fashion industry, especially for developing new designs for dresses. Dress designing and export of such dresses is a very important industry in France. North-Eastern France has a long tradition of manufacturing textiles. When machines were invented to weave woolen and cotton cloth, this industry became mechanised and many factories were set up in France. Even today this region is famous for its textiles.

Where does France get its raw materials for the textile industry? Wool is obtained from sheep reared in the highlands of France. However, France does not grow cotton. It imports raw cotton from other countries. Being a coastal country, it is easy for France to import and export goods.

Paris

Some regions of France developed industries even though they were not rich in minerals. One such place is Paris and the region around it. Paris, as you know, is the capital of France.

- *Look at the Map 3 and make a list of industries in and around Paris.*

Paris is a major commercial centre and is connected to all parts of France through roadways and railways. It is on the banks of the Seine. The Seine links Paris with the sea as large barges carry goods from the ships anchored on the sea coast to Paris. It is, therefore, possible to export machines, electrical goods, etc, from here. A large number of tourists from all over the world visit Paris. They too buy French goods like dresses, perfumes, leather goods, etc. As you know France and especially Paris is famous all over the world for its fashion industry.

Central France

You read about the two major industrial regions of France. Central France too has several industries. Coal mining in this region

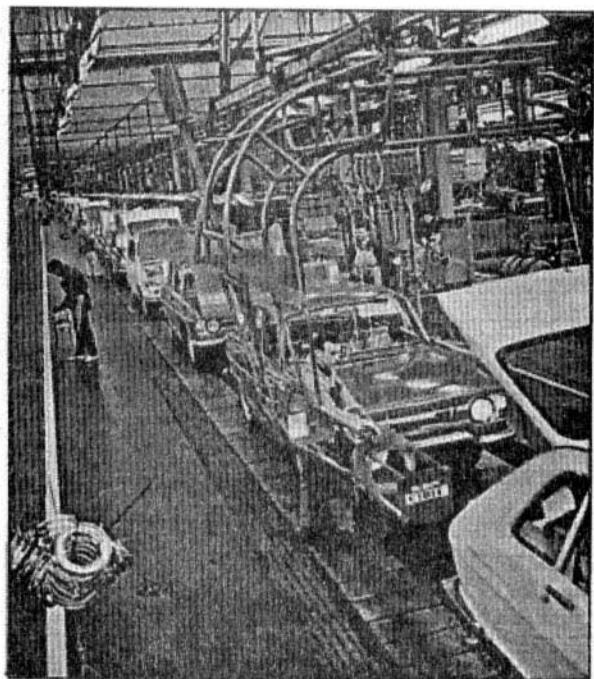


Fig. 6 Inside a car factory

helped in its initial industrialisation. However, as mentioned earlier, coal mining in France today is negligible. This region being well connected with all parts of France and this has helped in transporting raw materials and finished products.

The Mediterranean Coast

Look for Marseilles in Map 3. It is one of the largest ports of France. It has easy access to all the Mediterranean countries and also countries of other continents. Several industries have developed here. Some of them use agricultural products to produce olive oil, silk yarn and cloth and sugar. Other industries are based on metals, like ship-building, aircraft-making, manufacture of machine tools, etc.

Since cities such as Marseilles have a concentration of industries a large number of people have settled down near them. Thus they have dense population.

- *Look at the Map 3 and list the important industrial centres of France.*
- *Look at the map carefully and find out which city in France is the largest producer of watches and woolen cloth?*

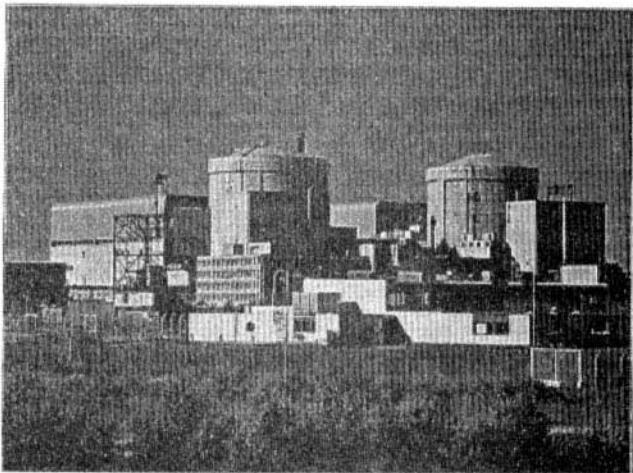


Fig. 7 A nuclear reactor in France

SOURCES OF ENERGY AND INDUSTRIALISATION

You read about the importance of sources of energy for industrialisation. Coal obtained from domestic sources takes care of only a very small part of the country's needs. Hence France has to import coal from the US and South Africa. France also does not have large deposits of petroleum or natural gas. France has to import petroleum from South America and the Arab countries.

In order to make good the shortage in sources of energy France took to nuclear energy. Today nearly 80% of French electricity is from nuclear energy. There are 61 nuclear reactors producing electricity in France. However there are problems in using nuclear energy. It produces radioactive waste material, which is very harmful to the health of human beings and animals and plants. As a result the government of France has decided not to increase the production of nuclear energy based electricity. France therefore has to increase the share of other sources of energy. France already uses its hydroelectric capacities to the full. So it has been forced to explore the possibility of using some new sources of energy like tidal energy from the ocean tides, solar energy and biogas.

- *What problems do you think France will face in using solar energy on a large scale?*
- *Find out where the electricity you use is made and which source of energy is used there.*

EXERCISE

1. What advantages does France have from being surrounded by seas and oceans on three sides?
2. Which part of France has extensive plains? Which rivers flow there?
3. What are the main crops of France? Why is there only limited cultivation in winters?
4. How do gentle showers throughout the year help French agriculture and animal rearing?
5. What natural factors facilitate animal husbandry in France?
6. Write a few sentences on the 'white revolution.'
7. In what way do you think foreign tourists help French industries?
8. Name the major industries of northern France. What minerals are found there?
9. Name the major industrial centre on the Mediterranean coast.
10. What are the uses of olives, grapes and sugarbeet?
11. Why does France use nuclear energy in a big way? What are its problems?
12. Compare the agriculture of France and your state with regard to the following points:
a) seasons b) crops c) size of holdings

CHAPTER 9

AFRICA

To the west of India lies a large continent. On this continent there are extensive deserts, dense forests, long and broad rivers, numerous large lakes and grasslands stretching over thousands of miles. There are certain wild animals, which we do not find in our country. The world's largest gold and diamond mines are located here. The name of this continent is Africa. Perhaps you will be surprised to know that Africa is the cradle of humankind. Human beings first evolved in Africa and then moved to other continents.

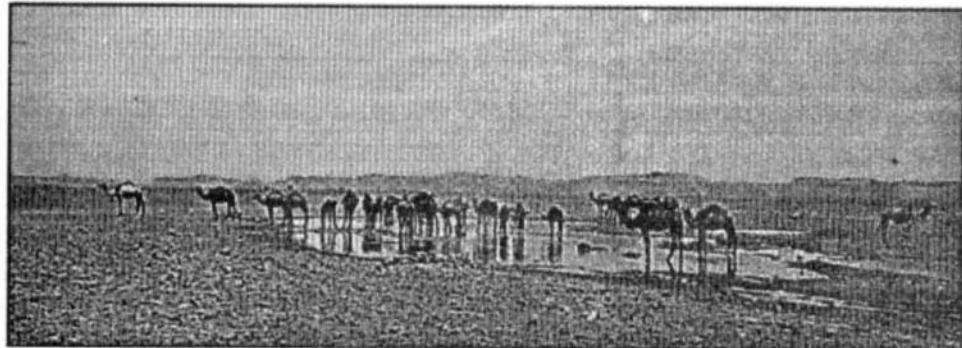


Fig.1

- *Look for Africa on the world map. Name the oceans that surround it. Which are its neighbouring continents?*

Fig.3.....



Fig.2



AFRICA – A VAST PLATEAU

Look at the physical map of Africa. Do you see any large plains in the interior of the continent? Only on the coast do we find a narrow plain. The rest of the continent is a vast plateau. If you look carefully at the map, you will see that the height of the plateau is not uniform. Look for the valleys of the Nile and the Congo rivers. There are also several mountains on this plateau. The highest peak in Africa is Mount Kilimanjaro in Tanzania.

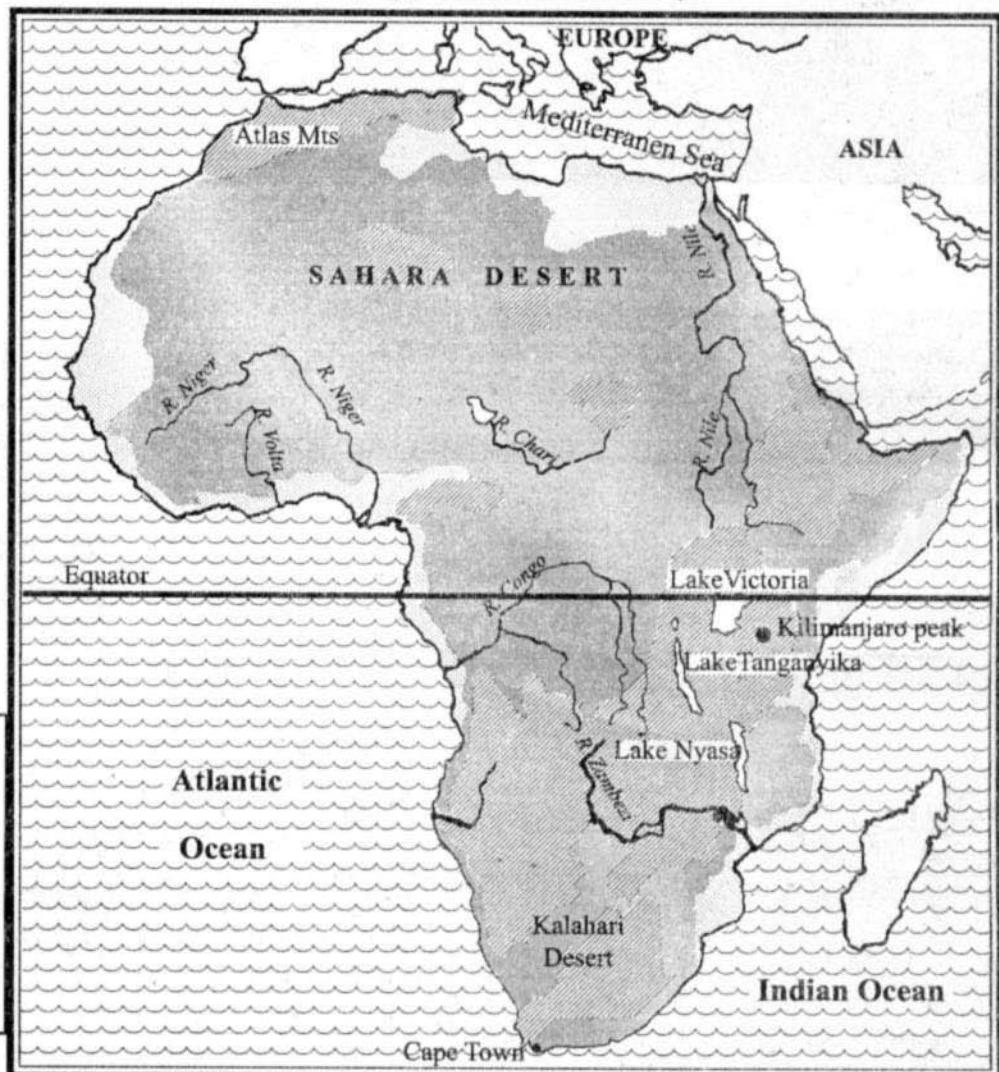
- *Look at Map 1 and answer the following questions:*

- *What is the average height of the narrow coastal plain?*
- *What is the height of a major portion of the plateau?*
- *The height of the high plateaus in the south and east of Africa is*
- *In the north is the Mountain.*

Look for some of the large lakes on the plateau. Lake Victoria is the largest lake in Africa. This is one of the largest fresh water lakes in the world. The Nile originates from this lake.

MAP 1 PHYSICAL MAP OF AFRICA

(Heights, Rivers and Lakes)



INDEX

- Above 1000 meters
- 200 to 1000 meters
- 0 to 200 meters



Figure 4. The Nile, flowing through the desert. There is greenery close to the river, and sand stretching out further away.

There are long and narrow valleys in the high plateau. There are several large lakes in these valleys.

- Identify two other lakes in Africa, other than Lake Victoria and write down their names.*
- Locate the following rivers on a map of Africa. Use map 6 to locate the countries of Africa. Which countries do the following rivers flow through, and which oceans do they empty themselves into- .*

River	Country	Ocean
1. Nile		
2. Niger		
3. Congo		
4. Zambezi		

- Are there any other rivers besides these in Africa?*

There is a region in the north where no rivers are to be seen. This is the Sahara Desert, which receives very scanty rainfall. There is only one river, which crosses the Sahara Desert.

- Find out the name of this famous river.*

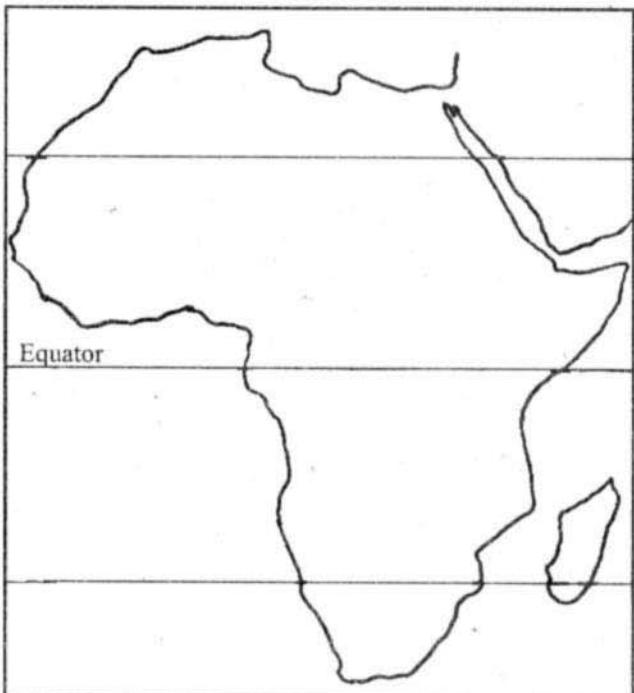
The region where this river has its source receives such heavy rainfall that there is enough water to flow across the desert into the Mediterranean Sea. The Nile also flows through

Egypt. Most of Egypt is a desert. The Nile has helped a civilization to develop in this desert. Egyptian civilization is several thousand years old. The waters of the Nile have helped to irrigate the fields of Egypt for thousands of years. (Look at figure 4)

CLIMATE

If you look at Africa on the globe you will find that the Equator passes through its middle. Thus Africa is divided into northern and southern parts.

MAP 2



- Try to recognize the Tropic of Cancer on the wall map of Africa and label Map 2. To the south of the Equator is the Tropic of Capricorn. Locate it and write its name in the correct place on the map.
- Does the Equator pass through the middle of any other continent?

The zone between the Tropic of Cancer and Tropic of Capricorn experiences a warm climate. In fact, this is the hottest region of the world. There is hardly any winter here. This region is also known as the *Tropic region*.

- Locate this zone on the map of Africa, colour it and label it as the 'Tropic Region'. Colour the zone north of the Tropic of Cancer and south of the Tropic of Capricorn in different colours.

These zones south and north of the tropics experience summer as well as winter. They are called '*Temperate Regions*'.

So far we have been talking only about summer and winter. However, regions that are hot but receive heavy rainfall have a different climate from hot regions that get scanty rainfall.

Regions with Heavy Rainfall

A large part of Africa, on both sides of the Equator, receives heavy rainfall. Look at the regions with heavy rainfall on Map 3. These regions are in Central and Western Africa. They have dense forests due to heavy rainfall and warm climate. You had read about similar forests in Indonesia in class 6.

Regions With Moderate and Scanty Rainfall

Look for regions with moderate rainfall in Map 3. You can see that the zone of moderate rainfall surrounds the zone of heavy rainfall. In the region of moderate rainfall, it rains only in the summer, while it rains throughout the year in the Equatorial regions.

As in our country, so also in the zones of

moderate rainfall in Africa, dry and wet seasons are distinct. Due to moderate rainfall tall grasses grow in this region. In some places these grasses are so tall that even elephants can hide in them! Some trees also grow between the grasses. This region is known as the '*Savanna*'. Look at this region in Map 4. Different kinds of wild animals inhabit this region. You will read about them later.

A very large part of Africa is extremely arid (dry), where the rainfall is scanty or there is no rainfall at all for several years.

- Locate these arid zones in Map 3.

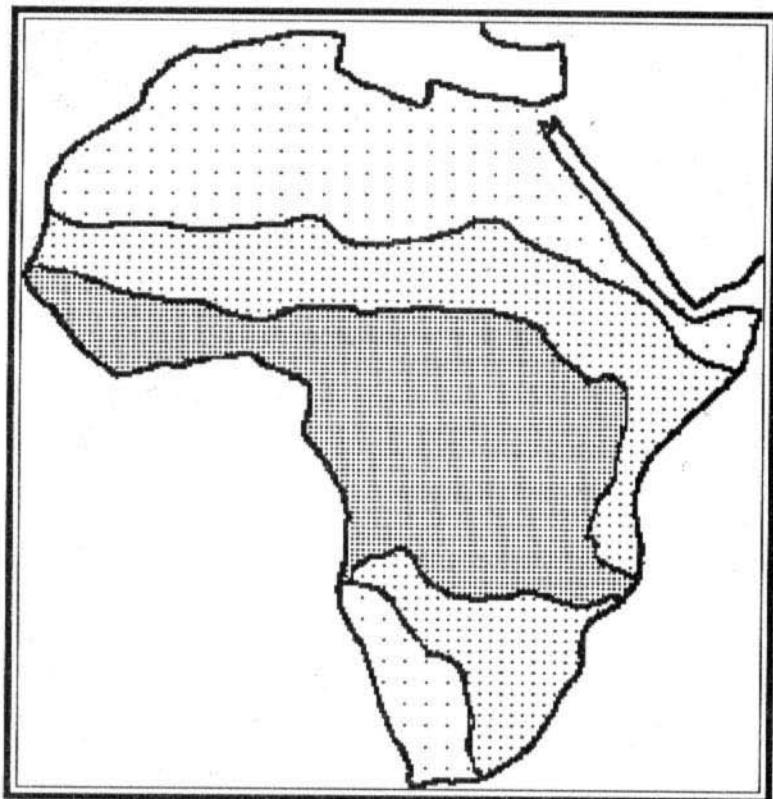
Almost half of the northern part of Africa is an arid region and is called the *Sahara desert*. Thorny bushes and short grasses grow in some parts of this desert. In other parts there are large stretches of sand, bare hills and rocks, stones and pebbles. In the south there is another arid region called the *Kalahari Desert*.

- Compare Map 3 and 4 and answer:
- Zones of heavy rainfall have vegetation.
- Zones of moderate rainfall have vegetation.
- Zones of scanty rainfall have vegetation.

Pictures of different areas of Africa have been shown in the beginning of the chapter. How varied is the scenario! Somewhere there is dense forest, in another area trees and grass grow together, elsewhere there is grass and shrubs, and in still other areas there is no vegetation at all.

- Looking at these pictures, can you guess how much rainfall these areas receive? Write 'heavy', 'moderate' or 'scanty' rainfall areas below the appropriate picture. Describe the pictures and say what you can infer about the lives of the people in these regions.

MAP 3 DISTRIBUTION OF RAINFALL IN AFRICA



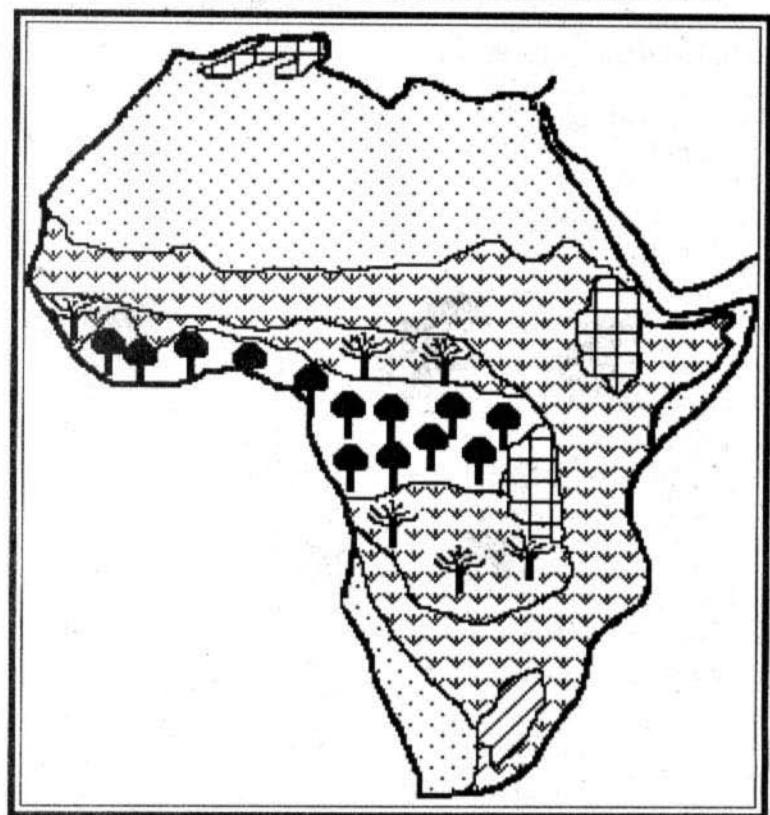
INDEX

[Cross-hatch symbol]	High Rainfall
[Dotted symbol]	Medium Rainfall
[White symbol]	Low Rainfall

MAP 4 NATURAL VEGETATION IN AFRICA

INDEX

[Tree symbol]	Equatorial forests
[Tree and grass symbol]	Broad leaved trees and grass
[Hatched symbol]	Savanna
[Diagonal hatching symbol]	Soft grass of high plateau
[Cross-hatch symbol]	Mountainous vegetation
[Dotted symbol]	Desert vegetation



THE PEOPLE OF AFRICA

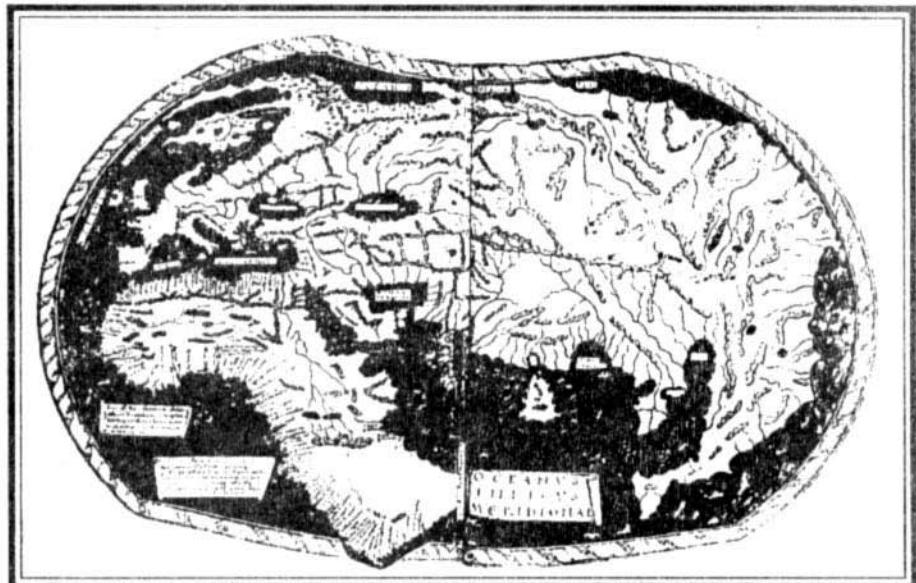
You have read about the different regions of Africa. Different kinds of people with different languages and lifestyles inhabit these regions. Since ancient times, people have lived in small tribes, carrying out hunting gathering, animal husbandry and agriculture. Hunters have inhabited the equatorial regions and the deserts. Pastoralists inhabited the high plateaus and Savanna, grazing their animals on the extensive grasslands. Agriculture has long been carried out on river-banks as well as on the margins of forests. There were several cities on the coasts where traders from distant countries came to trade.

Africa, Europe and Asia

For a long time, people from other continents were largely ignorant about Africa. Europeans were familiar only with the northern coastal regions of Africa.

- Look at the map and guess how Europeans would have reached the northern coastal areas. Which direction would one have to go to reach Africa from Europe? Which sea has to be crossed?*

Fig. 5 An ancient map of the world



Since ancient times, traders have been traversing the Mediterranean Sea, travelling between Europe and Asia. At that time they drew maps of the areas they passed through. One such map made in the 15th century (about 550 years old) is shown below.

- Does Europe of this map look the same as it does in your map? Look at the shape of Africa. Which part of Africa looks somewhat familiar? Which areas of Africa are not indicated at all in the old map?*

Looking at this old map, one realises that only northern Africa, about which Europeans had a little knowledge, was shown with some accuracy.

The traders of India and the Arab countries were familiar with the eastern part of Africa. These traders used to come to the ports of eastern Africa like Mombasa, Dar-e-Salaam and Zanzibar, to buy gold and ivory in exchange for rice, cotton, cloth and spices.

Apart from these coastal areas, neither the Europeans nor the Indian or Arab traders had much knowledge about the interior parts of Africa.

About 500 years ago, Europeans began their attempts to reach India by the sea route by going around Africa. Traversing the Atlantic Ocean, they would stop over on the islands of St. Madiera and Azores. They were apprehensive about going south of these islands. They thought it would be so hot further south that the sea would be boiling. Then in the year 1498, a Portuguese sailor named Vasco da Gama went around the southern tip of Africa and reached India.

- Look at the map on page 45 to answer these questions-
- In which direction does one have to travel from Africa to reach India?
- Which ocean has to be crossed?
- Are Asia and Africa connected by land?

The African Coast

While studying Europe, you must have noticed its broken coastline. You must have read about the gulfs and bays of Europe. Try to recall how these helped the Europeans in their ocean travel.

- Now look at the African coast. Do you see a broken coast or a smooth coastline?
- Do you find many bays and gulfs here, as in Europe?
- Name a bay and a gulf near Africa from Map 6

Problems in Reaching the African Interior

Since the African coastline does not have many sheltered bays or gulfs, ships found it difficult to halt along the African coast. Even if they managed to halt, it was extremely difficult to travel inland. The physical map of Africa shows that the continent is a huge plateau. You know that to reach a plateau one has to ascend its escarpment. This was a serious obstacle for travellers coming from the sea. In those times there were no roads or railway lines for access to the interior.

Sea travellers could travel to the interior parts of Africa via the rivers. However, the large rivers either descend turbulent from the plateau, or have high, narrow, rocky gorges. Due to these turbulent descents and high rocky banks, it was difficult to navigate these rivers and travel inland by boats.

Initially when Europeans tried to go inland, many African tribes came in direct conflict with them. Europeans indulged in

unfair trade and tried to enslave the African people and sell them abroad. Europeans wanted to establish their rule over Africa and exploit her wealth and resources. Hence, the African people attempted to resist the efforts of foreigners to establish themselves in their land.

Slave Trade

In the 16th century (1500 to 1600) many Europeans began migrating to America and started cultivation there. There was plenty of land in America, but not enough people to work on the fields. It was to fulfil this need for additional working hands in America that the slave trade from Africa began.

Africans were captured and enslaved mainly from the coastal areas of Guinea as well as the coastal regions of eastern Africa. The captured people were brought to the coast and sold to the Europeans. In exchange for the slaves, the African tribal leaders accepted guns, iron objects, liquor and clothes.

The slaves were greatly oppressed. Many of them died by the time they reached the ports. The ships were stuffed with slaves. There were no proper arrangements for food or medicine. In those days, it took a long time to reach America. Many slaves did not survive the journey due to illness and malnutrition.

Even in America, inhuman treatment was meted out to them. Despite working hard, they were not given proper food or living quarters. In this manner, millions of Africans were enslaved and taken to North and South America and the nearby islands. Lakhs of people died after being made into slaves. In the 16th and 17th century, numerous companies were engaged in the slave trade. Eventually, the slave trade came to an end in the 19th century and the slaves were declared free citizens in America in 1860.

European Colonies

Earlier you have read that Europeans had reached India by going around Africa. Subsequently, these Europeans started halting

at African ports. Slowly the Portuguese, Dutch, English, French and Germans gained a foothold in the interior and colonised these areas. The political map of Africa at the close of the 19th century is given below. The regions colonised by the European colonies have been indicated on this map.

- *Can you locate the countries that colonised Africa on a map of Europe?*
- *Which European countries colonised Sudan and Zaire?*
- *Can you point out any area of Africa which was not colonised? What are the present day names of the countries that are located in these areas?*

Along with attempting to build their colonies in Africa, the Europeans continued to explore the interior of the continent. They travelled to the source of the Nile in the north. In the west, they explored the entire valley of

the Niger and in the south they moved northwards from Cape Town. There they explored the region around the river Zambezi.

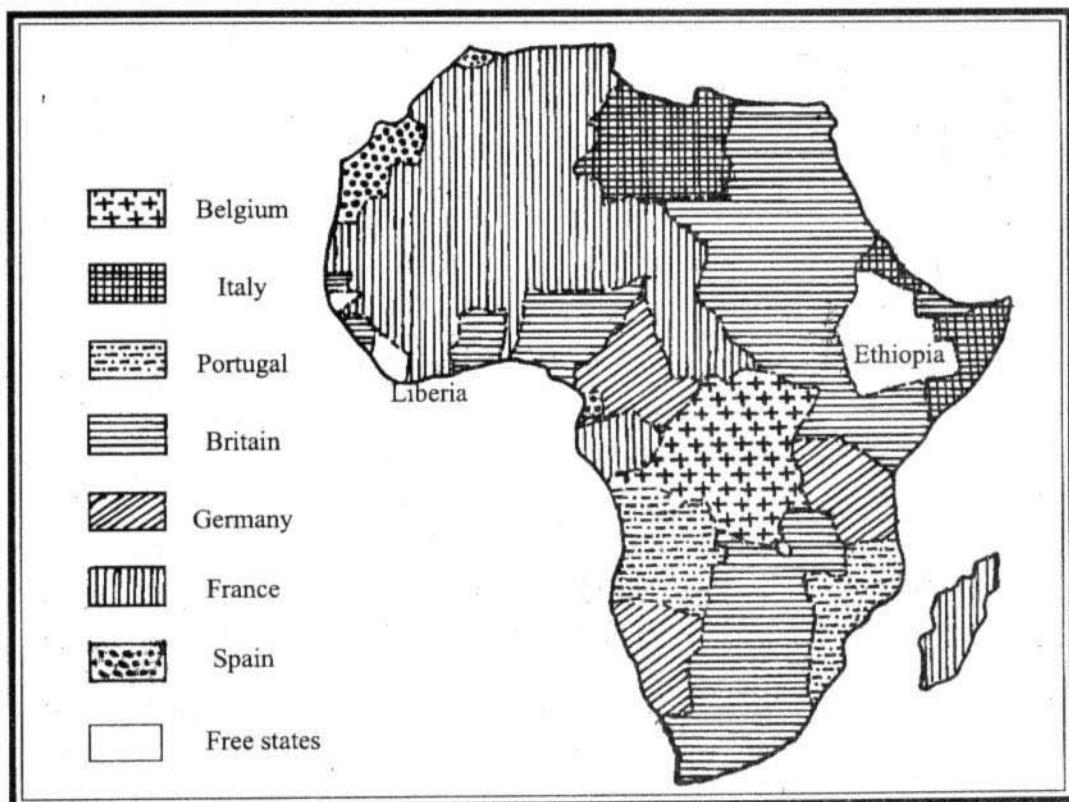
The Europeans exported African timber, minerals etc. on a very large scale to Europe. In fact, the gold and diamond mines in southern Africa are still under the control of European companies. Zambia and Zimbabwe have priceless mines of copper. This mineral has long been an important export item.

The Europeans did not stop with exporting the resources of Africa. They established plantations to grow tea, coffee, rubber, tobacco, etc. These products were also exported to Europe.

Independent Africa

During the course of the present century, African countries have been gradually gaining their independence from the control of European powers. New nations have come up

MAP 5 EUROPEAN COLONIES IN AFRICA



where the people have formed their own governments. Of course, many Europeans are still settled in African countries, but slowly the African people are acquiring control over their land, forests, mines, and agricultural

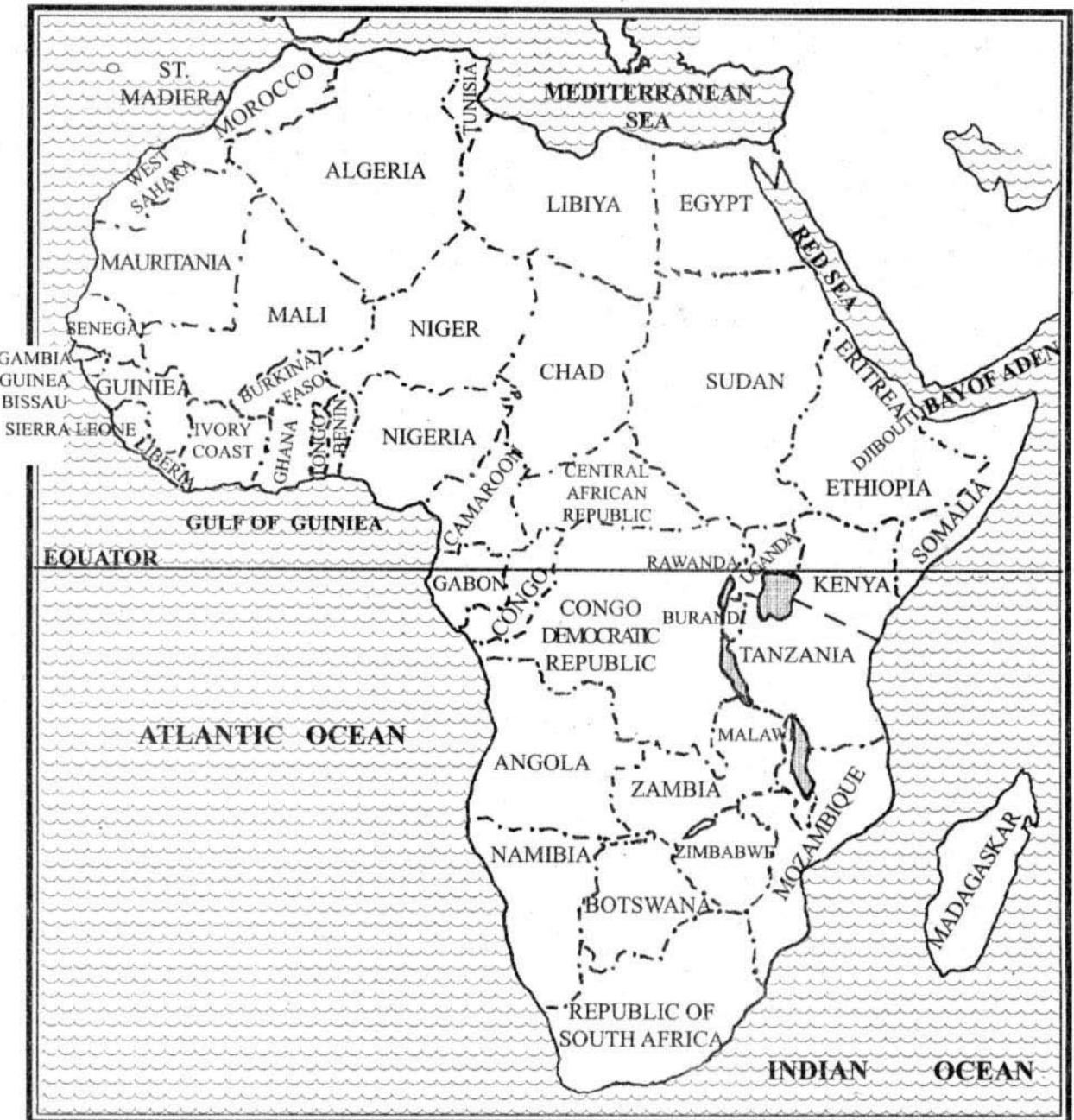
production and benefiting from these.

- Familiarise yourself with the countries of Africa by colouring and labelling Map 7.

EXERCISE

1. Which sea does one have to cross to reach northern Africa from Europe?
2. State three difficulties that the Europeans faced in reaching the interior parts of Africa.
3. Name the two large deserts of Africa.
4. a. The zone between the Tropics of Cancer and Capricorn is the zone of climate.
b. The main vegetation of Savanna lands is
c. The two main rivers emptying themselves into the Atlantic ocean are and
d. The regions in Africa to the north of the Tropic of Cancer and to the south of the Tropic of Capricorn are of climate.
5. Two political maps of Africa have been given in the chapter. Compare the two to find out which European country controlled the present day countries of Nigeria and Zimbabwe.
6. Name two countries of Africa where equatorial forests are found.
7. What goods did Europeans trade with Africa? What kind of agricultural produce did they promote for trade purposes?
8. Who benefited from the slave trade? Why did America need slaves?

MAP 6 COUNTRIES OF AFRICA



MAP 7 COUNTRIES OF AFRICA



First label this map with the help of Map 6. Then colour all the countries with different colours. Take care not to colour two neighbouring countries with the same colour.

Label all the seas and oceans and then colour them blue.

CHAPTER 10

NIGERIA - THE LAND OF MICHAEL'S ANCESTORS

Michael studies in Houston in the United States of America. One day, Michael's mother called him, "Michael! Wake up! I had told you that a family from Nigeria was coming to the neighbourhood. They have arrived. They have a boy of your age. Why don't you meet him?" Michael was very excited because his mother had told him that his forefather had come from Nigeria.

About two hundred years ago his great grandfather and grandfather were brought from Nigeria to America as slaves. You have already read that thousands of people were brought to America as slaves from Nigeria and surrounding places during that time. Slavery does not exist in America now, and Michael's family had not returned to Nigeria but settled down in America.

- See how far Nigeria is from America on a map.

Michael went over to meet his new neighbour. He had just opened the gate when he found a boy of his own age playing outside on the lawn.

"My name is Michael. I live next door. Have you just come from Nigeria?" Michael asked. The boy was happy to see Michael.



He had no friends in this new country. He said, "My name is Nabi. I have come from Lagos in Nigeria to stay with my uncle in America for a few months." Michael told him that his ancestors had been brought from Nigeria many years ago. Soon enough, Michael and Nabi became friends.

Michael would often ask Nabi to tell him about Nigeria and her people. He wanted to see and know more about the land of his ancestors.

SEASONS

One day it started raining. "It is cold in America and it rains only once in a while. In Lagos, however, it is never cold and it rains heavily throughout the year" Nabi said.

Michael wondered why this was so. Then Nabi took out an atlas and located the map of America. "Houston is in the Texas state, and is quite far north of the Equator, whereas Lagos is very near the Equator. Here, the sun shines overhead throughout the year and that is why it is very hot and it rains all the year round," said Nabi.

- Locate Houston and Texas state in a map of America. Similarly locate Lagos on a map of Africa.

"Oh! Then Nigeria has an equatorial climate," Michael said.

"I used to think so too, till I went to a city named Kano in north Nigeria." Nabi contradicted him. "Then I realised that only southern Nigeria has equatorial climate. Northern parts of Nigeria have a mild winter season also. And it rains only from May to October. It does not rain all the year round like it does in Lagos."

He took out another book and showed him a map of rainfall in Nigeria. A similar map is given below.

- Locate the cities of Lagos and Kano.
- Which city is near the Equator and which one is farther away?
- Which part of Nigeria gets maximum rainfall?
- Which part gets less rainfall?

Map 1 Nigeria: Distribution of Rainfall

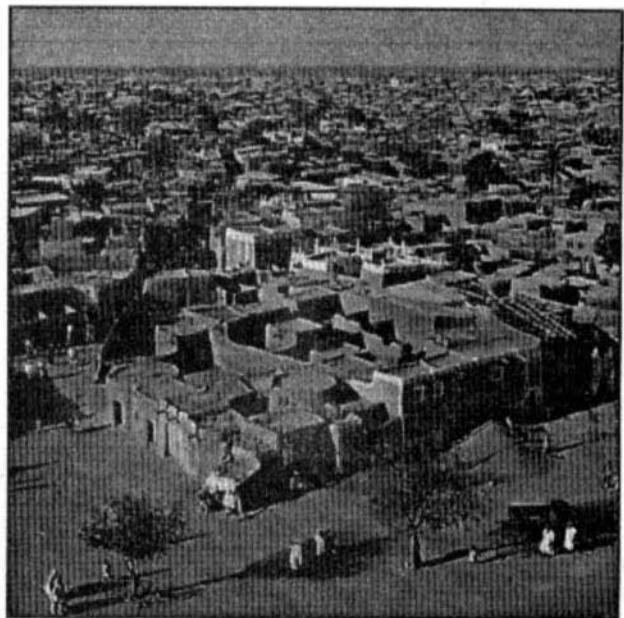
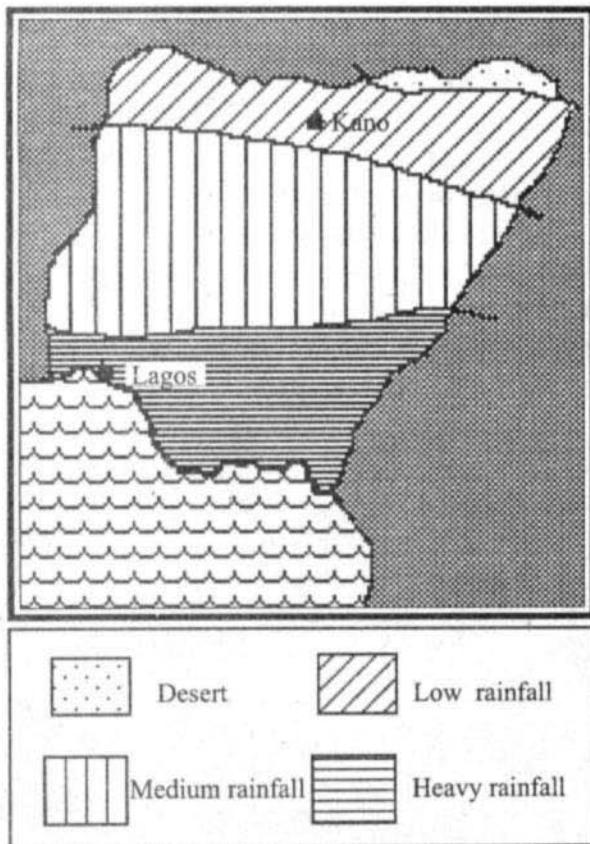


Fig. 2 Kano - Why do the houses here have flat roofs?

NATURAL VEGETATION OF NIGERIA

Nabi added that the trees found in southern Nigeria could not be found in northern Nigeria. In fact in the extreme north east no trees could be seen at all.

"The northern region of Nigeria is almost a desert. It is a part of the Sahara desert, which is the largest desert in the world." Nabi said.

- The natural vegetation of Nigeria is shown in Map 2. Compare this with the rainfall map and answer:
 - Regions with heavy rainfall have vegetation.
 - Regions with medium rainfall have vegetation.
 - Regions with low rainfall have vegetation.
 - Desert regions have vegetation.

Michael borrowed the book from Nabi to read. The book contained several photographs of Nigeria. Michael discovered many interesting things about Nigeria from the book.

Mangrove Forests

Nigeria's coast is not much above sea level. During high tide, salty seawater floods these coastal areas, small gulfs and deltas of rivers. When the tide subsides, the water recedes.

There are saltwater marshes in these coastal areas. Mangrove trees are found in large numbers in these marshy areas. In figure 3, look how the roots of the mangrove trees are sticking out of a marsh. They serve a number of purposes. They help the tree to remain above water during high tides. These roots are submerged under water when the tide comes in. They also help the roots to breathe, as the



Fig. 3 Roots of a mangrove tree

marshy soil does not contain much oxygen. They also help to anchor the tree to the loose soil. Mangroves are the only kind of trees that grow in salty soils and are very important for preventing the spread of saline marshes along the coasts. The wood of the mangrove tree is very strong and heavy. Its fruit is sweet. Mangrove forests form a 16-96 km wide belt in the coastal region of Nigeria.

The coastal areas of India too have mangrove forests. The Sunderban forests of the Gangetic delta (in West Bengal) are the most important mangrove forests in the country. Sunderi is the typical tree of this forest in India.

Equatorial Forests

Dense Equatorial forests begin where the saltwater marshes end. These forests contain tall trees, creepers, etc. like

mahogany, ebony, rubber, sapele, obeche, African walnut and oil palms. Since there is no dry season the trees here are evergreen and never leafless. Raffia palm is also a very important tree of this belt as its fruits yield cooking oil. Coconut trees can also be found in the entire belt. Equatorial forests form a 80-160 km belt after the mangrove forests.

- *Which other country that you have read about has such forests?*

See Figure 4. Have you seen such trees in the forest around you? Some of these trees grow 60 meters high. An interesting thing about these trees is that they give wood of different colours. Ebony has black wood, mahogany is reddish brown and obeche tree has white wood. In contrast, most of the trees in our country yield brown wood.

The Equatorial forests merge with monsoon forests towards the north. In these parts there is a dry season and the trees shed their leaves to conserve water. Leaves sprout again in these forests when it begins to rain in May or June.

There is a great demand for Nigerian wood in many countries, especially in Europe, because it is heavy and strong. Earlier, ships and boats were made out of such wood. This wood was also used as sleepers under railway lines. Nigeria earns much foreign exchange by exporting wood. However, this has also led to rapid depletion of forest resources.

Fig. 4 Felling mahogany trees in a tropical forest



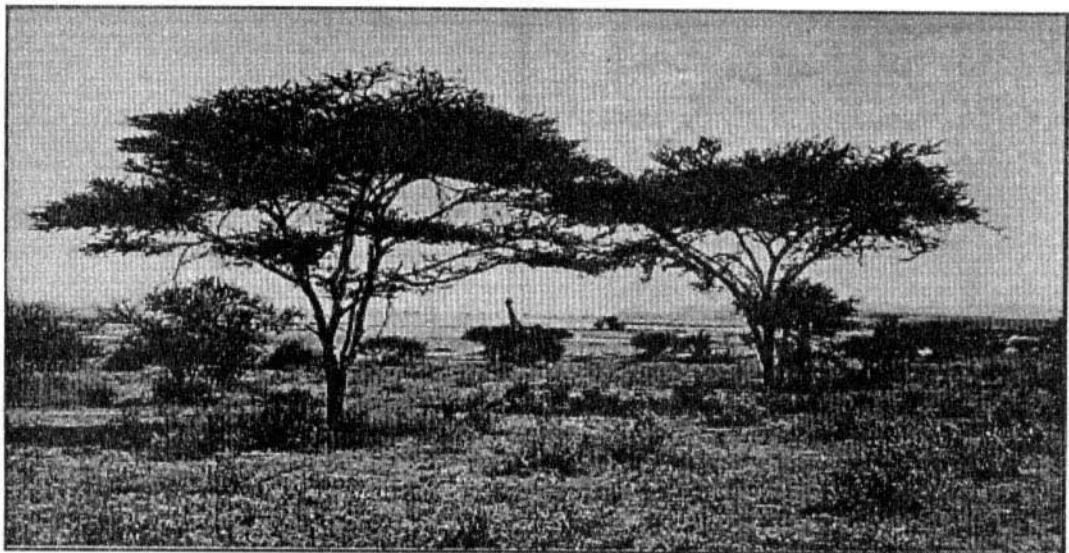


Fig. 5 Savanna region with umbrella-like trees

The Savanna

So far we have been talking about southern Nigeria near the coast. As we move inland, the rainfall declines. The trees are few and far between. Tall grass grows between the trees. The typical trees of this region are acacia, boababs, etc, which do not grow very tall. This is the Savanna region.

Trees grow closer together along the two major rivers, Niger and Benue, as more moisture is available there.

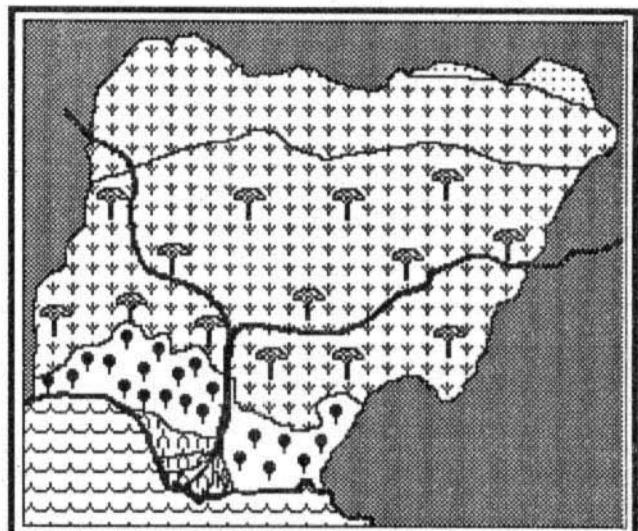
Have you wondered why there is more grass and fewer trees in the Savanna region? Trees need a lot of water. Grass grows in regions with low rainfall. You must have noticed that grass grows rapidly during the rains, after which it dries up very fast. In the next season, new grass comes up. This happens in the Savanna region also.

In the hot Savanna region, the grass is stiff and dry. It is not soft and juicy like in the cold regions of Iran, Poland or France. That is why animal husbandry is not very common in the Savanna region, except among a few tribes.

Rainfall declines as we move north and with it, the vegetation also changes. Both the trees and grass get shorter and shorter. Trees, typically, spread out just like umbrellas. (Fig.5)

If you have visited Gwalior or Rajasthan, you would have noticed small thorny trees (*babul*) and shrubs with grass growing in between. That is because this region also gets very low rainfall.

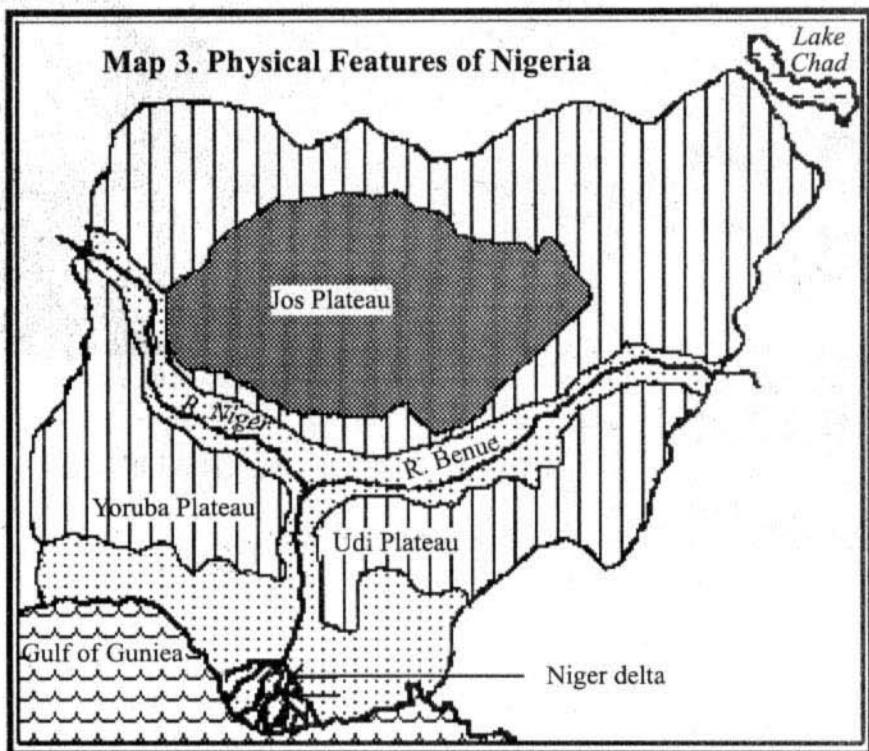
Map 2. Natural Vegetation of Nigeria



Index

	Thorny bushes		Equatorial forests
	Savanna grass		
	Savanna grass & trees		
			Mangrove forests

Map 3. Physical Features of Nigeria



Index

	600 to 1200 meters
	300 to 600 meters
	Less than 300 meters

NATURAL REGIONS OF NIGERIA

Michael was keen to know about the landscapes of Nigeria. He once asked Nabi if there were any high mountains there. Nabi said, "There are no large mountains in Nigeria. There are only small hills. That doesn't mean that we have a flat and uninteresting landscape. There is indeed great variety." He showed him some pictures of the Niger valley, its delta, the Jos and Yoruba plateaus, the deserts of the far north.

- *Look at Map 3 and locate the different parts of Nigeria as Nabi describes them.*

1. Niger Delta: "When the Europeans came to Nigeria following the sea route, they faced difficulties getting to the interior parts of Nigeria," said Nabi as he began to describe the different regions of Nigeria. "There were the marshes with dense mangrove forests. It rained heavily and there were no safe harbours. Then a few ports were built, where ships could anchor and smaller boats could go further up the Niger. It was from here that slaves were sent to America. Later on, it was from these ports, that wood and other products were sent

out of the country." Michael took out a map to locate the Niger. Nabi pointed out how the river split up into many branches near the sea and that such formations were called '*deltas*'.

- *Hang a wall-map of Africa in the classroom and identify the country from where the Niger originates. Into which ocean does it empty itself?*

Fig. 6 Settlement on the Niger Delta



- Which river in India has a very large delta?
- What could be the problems in carrying out agriculture on deltas?

2. Coastal Plains: The coastal plains of Nigeria stretch beyond the delta. These plains are about 120 meters high.

- Where has this height been measured from?

3 & 4. River Valleys and Plateaus: "As you move northwards of the coastal plains you would have to climb gentle slope to reach the Yoruba and Udi Plateaus whose height is around 300 meters." Nabi continued. "Then you have to descend a sharp slope to reach the two river valleys of the Niger and the Benue. After crossing the narrow valleys you will have to climb a steep escarpment to reach Jos Plateau. This is the highest part of our country. It is 1200 meters high."

"What lies beyond the Jos plateau? Is that the northernmost part of Nigeria?" Michael asked.

"No. If you descend a series of stepped scarps to the north-east you will reach Lake Chad. This is a vast lake and only a part of it is in Nigeria. The remaining part of the lake is in Chad, a country which has been named after the lake," replied Nabi.

- Can you name the four major natural regions of Nigeria?

PEOPLE

One day Michael had called upon Nabi. There he found Nabi talking to his mother in a very different language. All along he thought that the people of Nigeria spoke English. "In which language were you speaking to your mother?" he asked Nabi. "I was speaking in Ibo language. It is my mother tongue. Ibo is



Fig. 7 Nigerian women selling yams in the market

the language of the Igbo tribe and I belong to this tribe," replied Nabi.

"Are there other tribes in Nigeria?" Michael asked. "Yes. There are several. The Fulani, the Yoruba, the Hausa etc. They have their own languages and ways of life." Michael wanted to know more about the tribes. Nabi told him that most of the tribes practised agriculture and lived in small villages in which most of the villagers were related to each other. Of course, recently a large number of young people were migrating to towns to take up new jobs in factories and offices.

AGRICULTURE

"What do the people of Nigeria eat normally?" asked Michael one day, as they were having their lunch.

"The food of the people consists of yam, cassava, guinea-corn, rice and beans. Cassava is a kind of tuber like the sweet potato. It features largely in the diet of the people there." Nabi answered. (See figure 8 below)

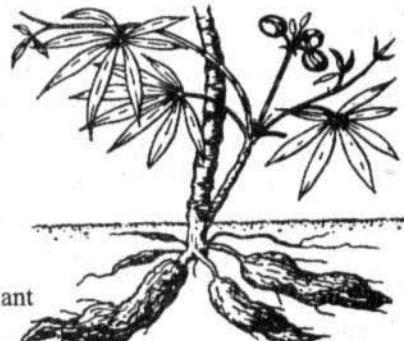


Fig 8.Cassava plant and edible roots



Fig. 9. Cocoa tree

Agriculture as practised by the tribes of Nigeria seemed so different that Michael listened to Nabi with rapt attention. Every year the groups of tribesmen cleared a small piece of forest land of its trees and burnt the wood. Then all the families distributed that piece of land among themselves. Often they shared the work and helped each other at harvest and other times.

Michael said, "Why only a small piece of land? In America holdings of land are sometimes as large as a few hundred acres."

Nabi answered, "In America, land is cultivated by machines such as tractors, and production is oriented towards trade. In Nigeria, farmers cultivate just enough to meet the requirements of their families. They use the hoe to plough their fields. Even the use of bullock or horse driven plough is very rare. So, production is also limited. However, things are changing fast these days. Even in our country we have started having large personal land holdings in which crops are grown for sale in the market."

A few days later Nabi visited Michael at his house. Michael told him that his parents had gone to work in the cotton fields and that he had to stay at home. Nabi asked with surprise, "Is cotton grown even in America?" Michael asked, "Is cotton grown in Nigeria, too?" Nabi said, "Yes, but you know that in our country north and south have different climates and that is why different crops are grown in different regions".

Crops and Plantations of South Nigeria

Michael took out some chocolate and offered it to Nabi. Nabi asked, "Did you know that chocolate is made out of cocoa?"

Michael said, "I knew that, but I have never seen this fruit" Nabi took out a book and showed him the picture of the cocoa fruit and said, "We have large cocoa plantations in Nigeria."

Nabi added, "In southern Nigeria, apart from cocoa, there are also rubber plantations. Oil bearing palm trees are also found there. Oil is extracted from its fruit. People reach these forests after crossing the River Niger by boat and then collect palm fruit."

"Earlier all these trees were found wild in forests. When the demand for these products increased, patches of forest were cleared and these trees were planted there. Cocoa, rubber, palm and palm oil are being exported and this enables Nigeria to earn foreign exchange." Look at the palm tree in figure 11.

- *In Map 4, identify the region of Nigeria where these crops are grown?*

Fig. 10 Cocoa fruit





Fig.11 Women taking cocoa fruits to the market. Oil palms line the roads

"Why were these trees grown in plantations when they already grew wild? Who planted them?" Michael asked. "Plantations were started by the British who were not satisfied with the quantity of wild products collected from the forests. They wanted to produce more and export them," Nabi answered.

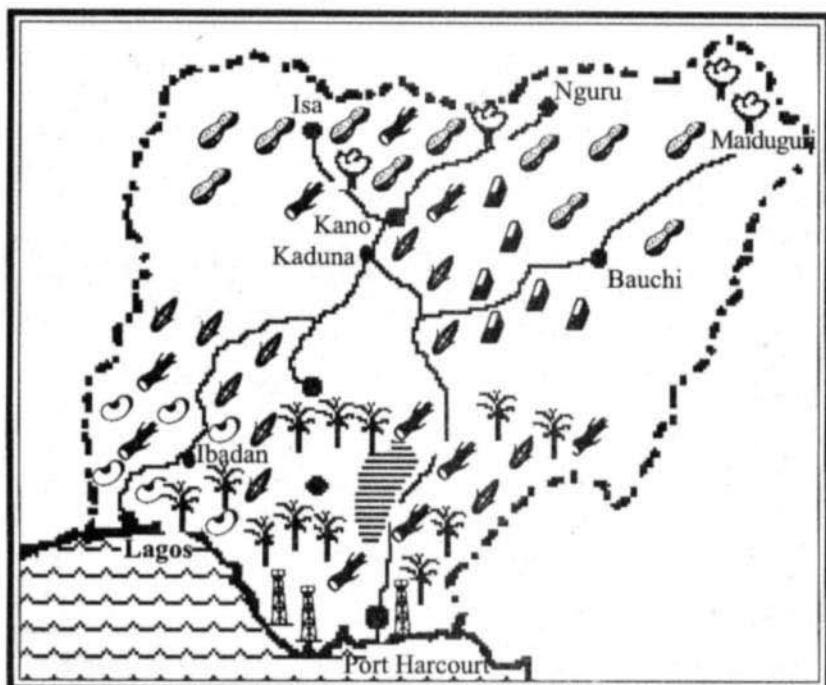
Plantations made many things easy for them. First of all, there was no longer the

difficulty of going into the forest and locating the trees. It was easy to look after the trees since the trees were all located in one place. Harvesting the produce also became much easier. Production, which was necessary for trade, increased.

Not only this, a number of processing units were also set up near plantations, such as units to separate seed from the cocoa fruit, to dry it, extract oil from palm fruit, extract milk from rubber plants, etc. Nigerian people started working in these plantations, while the British were their managers. In this way, commercial agriculture of palm, cocoa and rubber began in Nigeria.

Most of the profit from trade of palm, cocoa and rubber went to the British. The Nigerian people worked there only as agricultural labourers. Even in India during British times, plantations of tea and coffee were started for trade purposes. Nigeria was under British rule until 1960. In 1960 Nigeria won independence. After that the plantations and trade in plantation products have gradually come under the control of the Nigerians and they are able to benefit from these.

Map 4. Crops and Natural Resources



INDEX

	Cotton
	Palm oil
	Corn
	Cassava
	Cocoa
	Groundnut
	Tin
	Crude oil
	Coal
	Rail line

Agriculture and Animal Husbandry in Northern Nigeria

You know that northern Nigeria is the region of Savanna grass. It rains very little here and only grasses and some thorny trees are to be found. Cattle-rearing is an important occupation of the Fulani tribe which lives in the north. They also rear sheep and goats. Trade in hides and skins is an important commercial activity here.

Only crops that can be grown in low rainfall regions are grown in the north. Most common food crops are coarse grains such as millets, guinea corn and cassava. In some areas, wheat is also grown. Trees here are generally not cut down and can be seen standing in the middle of the fields.

- ***Make a list of crops grown in the heavy rainfall region of the south and the low rainfall region of northern Nigeria.***

Here also, some commercial crops are grown, such as kola nuts, groundnuts, tobacco and cotton. Kola nuts are of great importance in the lives of Nigerians. It is specially served to honoured guests. You may have tasted cola soft drinks. Kola nut is used in the production of many of these drinks. That is why the Kola nut is also exported on a large scale.

Northern Nigeria has been cultivating cotton for a long time. People weave cloth on hand-looms and also grow cotton for commercial use. Railways were built near cotton fields to facilitate easier transport so that trade becomes easier. Now cotton mills, too, have been set up in Nigeria.

Groundnuts are also grown in plenty in northern Nigeria. The British introduced groundnuts in this country, as the soil and climate were suitable for their growth. Factories have been set up in Kano and in Kaduna to extract oil from groundnut.

- ***Locate the regions growing cotton and groundnuts in the map.***

MINERAL OIL

One day Michael was very happy. "We went to see a mineral oil well from our school," he told Nabi. "We use petrol every day but today I saw an oil well. Have you seen one? I have heard that in Nigeria, too, mineral oil is extracted from wells."

"Mineral oil is the most important natural resource of our country. My uncle works in one of the oil rigs. So I have seen them too," replied Nabi.

- ***In the map, look for the mineral oil regions of Nigeria. Name the ports from where this oil would be exported.***

Since 1958, mineral oil has been exported from Nigeria. Oil refineries have been set up at Harcourt and Vari port. One such factory has also been set up in Kaduna city in middle Nigeria.

"In that case, Nigeria must be getting plenty of money from foreign countries in exchange for the oil," Michael said. "This industry is mostly in the hands of foreign companies. The Nigerian government has only a small share in this industry" Nabi answered sadly.

Michael started examining the map of Nigeria and said, "A number of minerals are mined in your country now." Nabi told him that the British had not discovered many minerals. These days, many minerals are being discovered and mined.

- ***Look at the map and list the minerals that are mined in Nigeria.***

Nabi told Michael that metals such as zinc, iron and lead are mined. Michael reasoned that if Nigeria is so rich in natural resources and agriculture, then its people must be rich, too. Nabi said, "Yes we are rich in natural resources and agriculture, but we have not been able to use these resources to their full capacity. Moreover most of our resources have remained in the hands of

foreign companies. Presently, the Nigerian people are slowly establishing industries. A number of small and large factories have been set up. We are trying to make full use of

our own resources. We are very hopeful that ultimately we will be successful in this effort of ours, no matter what problems come up or how hard we have to work."

EXERCISE

1. How are the equatorial forests useful to the people of Nigeria?
2. Name three cash crops of south Nigeria.
3. Name at least four crops, which the farmers of Nigeria cultivate for their food.
4. Why do some tribes in north Nigeria practice animal husbandry? What difficulties do you think they would be facing?
5. When you move from south to north Nigeria, what differences do you notice in a) terrain b) rainfall c) vegetation?
6. Separate the occupations of north and south Nigeria from the following list:

Occupations	North Nigeria	South Nigeria
1. Coal mining		
2. Tin mining		
3. Mineral oil mining		
4. Animal husbandry		
5. Rubber plantation		
6. Palm plantation		
7. Groundnut cultivation		
8. Cotton cultivation		
9. Loading, unloading		
10. Extracting groundnut oil		
11. Extracting palm oil		
12. Cocoa cultivation		
13. Cultivation of yam and cassava		
14. Cultivation of kola nut		
15. Lumbering		

7. What differences do you notice between figure 2 and figure 6? Can you explain the reason for these differences?
8. What is the height of the Yoruba Plateau and the Jos Plateau?
9. Nigeria, like India, was a colony of the British till recently. Do you think there are any other similarities between India and Nigeria?

CHAPTER 11

IAN AND MARY GO TO SEE THE VICTORIA FALLS

It was the warm month of June and Ian and Mary were very excited. Their parents had promised to take them on a trip to southern Africa to see the Victoria Falls and a wild life sanctuary nearby. Victoria Falls as you may know is one of the most spectacular waterfalls in the world. It is situated in Zimbabwe, a country in southern Africa. Here, the river Zambezi descends into a deep valley from a height of about 360 feet. While descending into the valley, the Zambezi forms a waterfall. This is called the Victoria Falls. Forests, which are reserved for the free movement of animals and where hunting is prohibited, are called sanctuaries.

Map 1. Great Britain to Zimbabwe



Ian and Mary study in a school in Great Britain. They were very keen to know the location of Victoria Falls. How would they reach there? Their mother had told them that they would be flying from London to Cape Town in South Africa. From there they would travel by train to Victoria Falls. Cape Town is situated on the Cape of Good Hope. A cape is the tip of a large landmass jutting into the sea and Cape of Good Hope forms the southern tip of Africa. You had read in an earlier lesson that Vasco da Gama, the Portuguese sailor, was the first European to go around Africa to reach India. He had landed at this place and realised that he had finally reached the end of Africa. This gave him the hope of reaching India. Hence the name 'Cape of Good Hope'.

- Which ocean would Ian and Mary be crossing in their flight?
- Trace the route they would be taking on the map.

Southern Africa

Mary brought the globe and began to search for the countries of South Africa and Zimbabwe. You too bring a globe to your classroom and see where these countries are located.

"Ian, look! This country is south of the Equator" Mary exclaimed. "So what?" asked Ian. "Hey, don't you know that when it is summer to the north of the Equator, it is winter to the south of the Equator? This means that in June, it will be winter in Zimbabwe!" Mary explained.

The southern part of Africa is situated to the south of the Equator, that is, it is in the southern hemisphere. Countries like India and

England are north of the Equator, which makes them countries of the northern hemisphere. You are aware that it is warmer near the Equator and gets cooler as we move away from it. Here's another interesting fact. The seasons are reversed as we cross the Equator. That is, when it is summer in countries of the northern hemisphere like India, it is winter in countries of the southern hemisphere.

- Look at map given on page 76 and find out in which hemisphere the following countries of Africa are and fill in the following table:*

Country	Hemisphere	Season in June
Algeria		
Namibia		
Botswana		

ZIMBABWE

Zimbabwe is a small country in southern Africa. In the old maps, this country goes by the name of South Rhodesia. To the north, lies Zambia, which was earlier known as North Rhodesia. Rhodesia is an English name. How did this name come to Africa?

Cecil Rhodes

Originally this was the land of the Zulu tribe. In 1889, an Englishman named Cecil Rhodes came here to prospect for minerals, and set up a company for this purpose. Rhodes sent about 200 Englishmen to this region, who later settled here. By 1895, they made Rhodesia a colony of Britain. The whole region was named Rhodesia after Cecil Rhodes. Thousands of British and other Europeans settled down here after displacing the Zulu people.

The native people of Zimbabwe fought several battles with the British, in which many lost their lives. But eventually the British established their rule. The native people of this region kept up their struggle for independence, and finally in 1980, Rhodesia attained

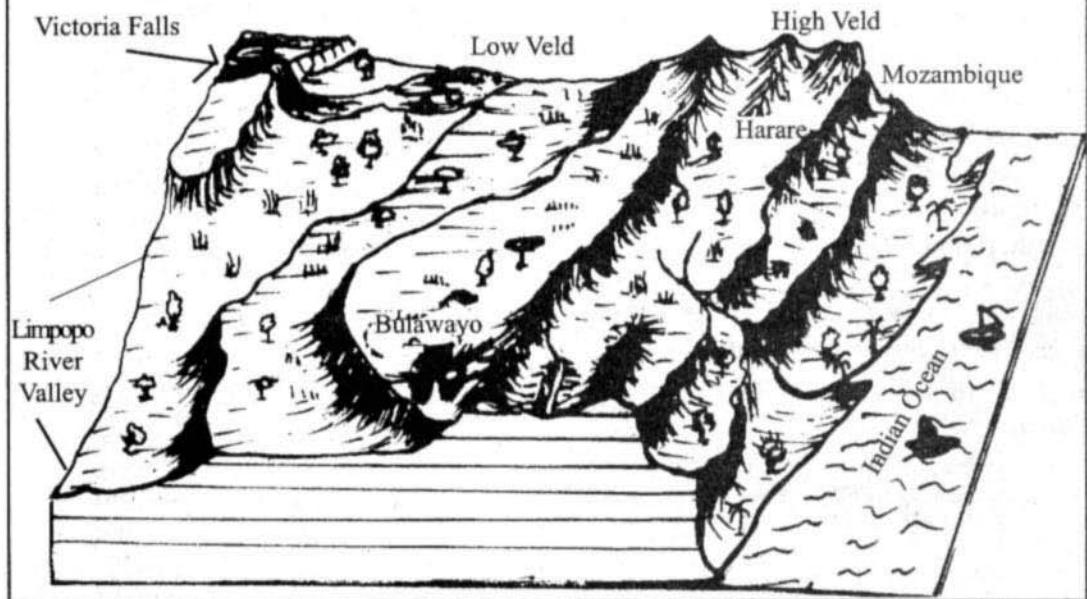
independence. This independent nation was named Zimbabwe after the ruins of a medieval civilization found there.

Ian and Mary reached Cape Town by a flight from London. At one point during the flight, the captain had announced that they were crossing the Equator. Ian and Mary were eager to see the line that divides the earth into two halves, but could see no line from the window of the aircraft. "But we can't see any line here!" they said with disappointment. "That is because the Equator is an imaginary line drawn on maps and globes and it is not a real line on the

Fig. 1 Ruins of Great Zimbabwe



Figure 2 The Terrain of Zimbabwe



earth!" said their mother. All the same, they were very excited about crossing into the southern half of the world.

On getting off the flight they felt the cold air. They realised what it means to be in the southern hemisphere which experiences winter in the months from May to August and summer from November to February.

Ian and Mary arrive in Zimbabwe

Ian and Mary traveled by train from Cape Town across South Africa and Botswana and reached the city of Bulawayo in Zimbabwe. They took out their atlas to find out where exactly they were.

- Locate Bulawayo in Map 2.

High and Low Velds (plateaus)

Now the train left Bulawayo and proceeded towards the Victoria Falls. Ian and Mary took out their book and read more about Zimbabwe. Look carefully at the picture above. The whole of Zimbabwe is a plateau. Some parts of the plateau are high and some are low. The high plateau in Zimbabwe is called the High Veld. The cities of Bulawayo and Harare are situated on the High Veld. The Valley of the Zambezi river is

in the north and the valley of the River Limpopo is in the south. The river valleys and the region surrounding them are called the Low Veld.

- Look at Map 2 and fill in the blanks:
- The height of Hwange is between meters and meters. Hence it is situated in the Veld.

Map 2. Zimbabwe



INDEX

<input type="checkbox"/>	500 to 1000 m	<input checked="" type="checkbox"/>	1000 to 2000 m
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Fig. 3 Victoria Falls

- The height of Harare is between meters and meters. Hence it is situated in the Veld.

You know that it is cooler in high places. That is why the climate of the High Veld is cooler than that of the Low Veld. You may remember that Pachmarhi, the famous hill station of Madhya Pradesh is at a height of about 1000 meters and it is cooler than the rest of the state.

The Savanna Region

Ian and Mary saw that there were extensive grasslands in Zimbabwe. There was green and soft grass near Bulawayo. From the train, domesticated animals like cows and sheep could be seen grazing. In between, there were fields. Dotting the grasslands at places were some trees with very large trunks. They remembered that in the Savanna region of Africa there were Baobab trees and the circumference of their trunk could be as much as 30 feet. People even live in the hollow of their trunks. Mandu, near Indore in MP, has a large number of these trees and here they are called 'Vilayati Imli'.

The train then started moving in a north-westerly direction towards Victoria Falls. Here the slope was downward. The forest was becoming denser as they approached the Zambezi river. It was greener here, although the high grass here was coarse. Mary said, "Well, we have now come down to the Low Veld. We had read that this is the region of coarse grasses. But why can't we see any cows or sheep here?"

Ian and Mary's father told them that in the Low Veld, there was a poisonous insect called the tse tse fly, whose bite can cause death to not only human beings but even to animals. Domestic animals are reared only on the High Veld, where the incidence of this pest is lower.

Victoria Falls

Finally, the day dawned when Ian and Mary saw the Victoria Falls. The Zambezi river bubbling and churning, noisily falls from a very high cliff to the bottom of a steep gorge, throwing up fountains of spray. The river is very wide, and falls from a great height. You too can see the picture of the Victoria Falls (Figure 3). The water spray is

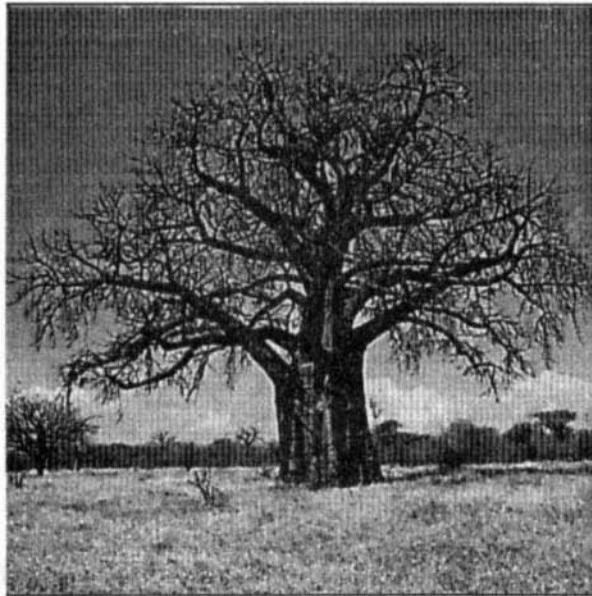


Fig. 4 Boabab Tree

so strong that the regions surrounding the Falls become wet. When the sun's rays fall on the spray, rainbows are formed. You must have seen rainbows in the sky, but you may not have seen a rainbow on a river. Ian and Mary watched the falls for a long time, in fascination. Then they went by jeep to see a dam and a large reservoir on the Zambezi river. This is called the Kariba Dam and hydro-electricity is generated here.

WILD LIFE SANCTUARY

Before long they reached the sanctuary reserved for the free movement of wild animals. They had travelled only a short distance when Mary cried, "See! A whole herd of high necked giraffes chewing even the upper leaves of trees. What long necks! And the giraffe is itself 14-18 feet high. See the giraffe kids who stand between the legs of their mothers." Then their jeep reached an open



Fig. 5 Giraffe

space. There, under a tree, a lion, lioness and their cubs had killed a deer and they were eating it. They immediately became cautious and the driver quickly drove the jeep away. Then they approached a small lake. "Oh, what kind of animals are these black and white striped horses?" Ian said, "Have you forgotten? These are zebras. Look! There are some more zebras grazing under the trees."



Fig. 6 Impala

Just then, a herd of deer ran across in front of their jeep. The driver said, "It seems that a lion is around, that is why the deer are running away." Mary said, "Look how their horns are twisted!" Their father explained that here there were many varieties of deer. The lions chase the deer, catch them and eat them up - this is their food. Mary said, "What do the deer eat?" Their father told them that in the Savanna region, animals like deer, zebras and giraffes survive on grasses, leaves

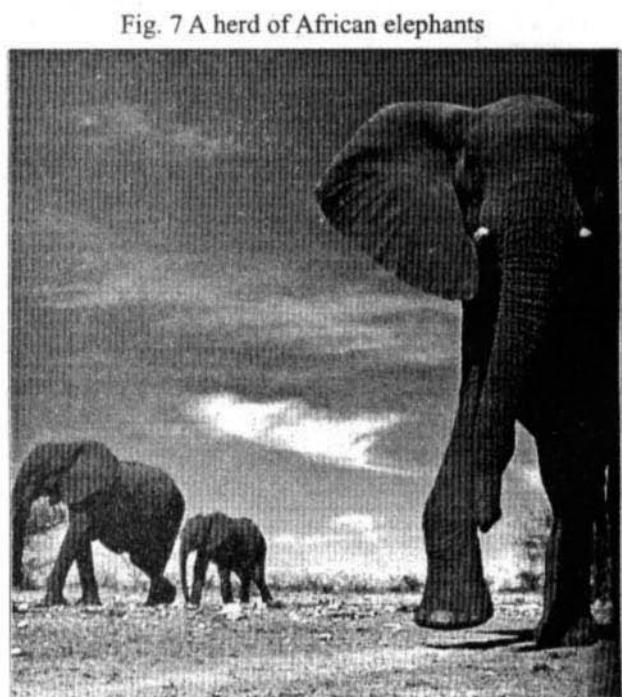


Fig. 7 A herd of African elephants



Fig. 8 Hippopotamus

etc. and lions, cheetahs, jackals, fox, etc. in turn make these animals their food."

The jeep reached a nearby hill. Far below, they could see a grassland. In between a herd of animals could be seen. The driver of the jeep said, "These are bisons going towards some other areas." And then a herd of elephants emerged from the high grasses. Oh, so many elephants! They went to the lake and drank water, and sprayed water from their trunks over their bodies, trumpeting loudly all the while.



Fig. 10 Rhino

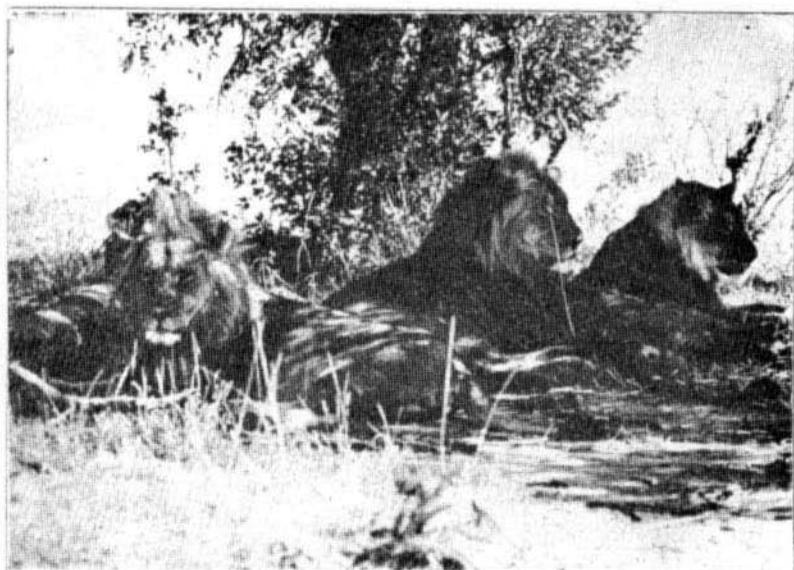
- Do you see any difference between these elephants and the elephants of our country?

"It is almost evening now and it is not safe to stay here," said Mary's father and instructed the driver of the jeep to turn back. They began their return after visiting the sanctuary. Now they were to visit Harare, the capital of Zimbabwe. They began to climb onto the High Veld, leaving the Low Veld behind.

Fig. 11 Lions at rest



Fig. 9 A zebra with her newborn foal



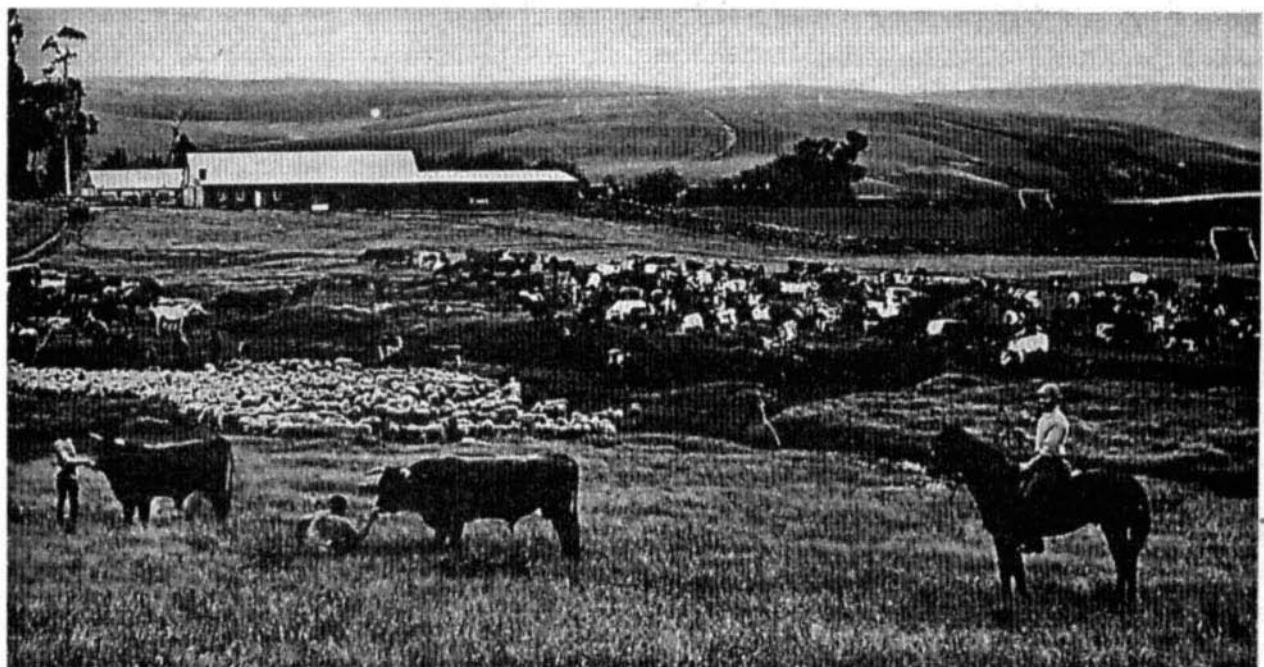


Fig. 12 The farm of an European settler

Animal Husbandry on the High Veld

The High Veld or the high plateau of Zimbabwe is not infested with tse tse flies and due to the cold climate the grass is also good, soft and juicy. Thus animal husbandry has been developed here. Here, a lot of the land is used as pasture.

Before the advent of the British, the inhabitants of Zimbabwe used to rear animals such as goats and sheep. At that time, animal husbandry was not a big business, as developed by the British after they settled down in Zimbabwe. Now, most of the animals are reared for meat e.g. cattle, pig, etc. Cold storage (refrigerated rooms) have been built in cities for preserving meat. Factories have also been set up to process milk into butter and cheese.

- *Discuss the difference between animal husbandry in our country and in Zimbabwe.*
- *Observe figure 12 carefully and describe it in detail.*

Agriculture and Important Crops

The main occupation of the people of Zimbabwe is agriculture. The inhabitants of

Zimbabwe belong to the Zulu and Bantu tribes. They do not use the ox and plough in agriculture. They make a clearing in the forest and burn the rubbish. They then make furrows with their hoes and sow the seeds in them. Not much land can be cultivated by this method. A family produces just enough grain for their use in a few acres of land. They mainly grow maize, millets, groundnut, soyabean and tubers.

When they started settling on the High Veld, the British purchased land and developed it for cultivation with the help of tractors and other means. They ploughed the land and made it fit for agriculture. They also used chemical fertilizers and high yielding seeds. The land

Fig. 13 Bantu women in a corn field



holdings of the English were also very large. They started extensively cultivating wheat and maize. Soyabean and sunflower too began to be cultivated. Vegetables and fruit, especially oranges and lemons were grown.

As the farmers realised that the climate of Zimbabwe is suitable for the cultivation of tobacco, the cultivation of tobacco, too, started on a large scale. Among the goods exported from Zimbabwe, tobacco is an important item.

Local Bantu people work as agricultural labourers on the fields of the British settlers. The Bantu menfolk left their own agricultural land and came to work in these fields in search of livelihood. The Bantu women looked after the small fields along with performing their household tasks.

After independence in 1980, the government provided technical support, loans etc. to small farmers and now production of these farms has improved. Now the government is also providing technical education for agriculture, loans and other facilities to women. Nowadays, the demand for agricultural produce from Zimbabwe is going down in the world market. Therefore, many Europeans are selling their farms.

- *Look carefully at Figure 13. Can you list out the possible problems these women labourers could face?*
- *Why did the Bantu men go to work on the fields of the English?*

MINERAL EXTRACTION INDUSTRY

Transport Routes

Ian and Mary had reached Harare now. They wanted to see some places near Harare. In the meantime, Thomas, a distant relative of theirs, came to meet them in the evening. Many years ago, he had come from Britain to settle down in Zimbabwe. He told them that he worked in a mining company which

was situated a little away from Harare on the rail route. Thomas added that it was the laying down of the rail routes that had made the mining industry possible.

Mary asked, "Why was this so?" Thomas answered, "Mineral ore is very heavy. Usually, mineral ore is processed far away from the place where it is mined. That is why most of the mines in Zimbabwe are near rail routes or roads."

Where are mining industries set up?

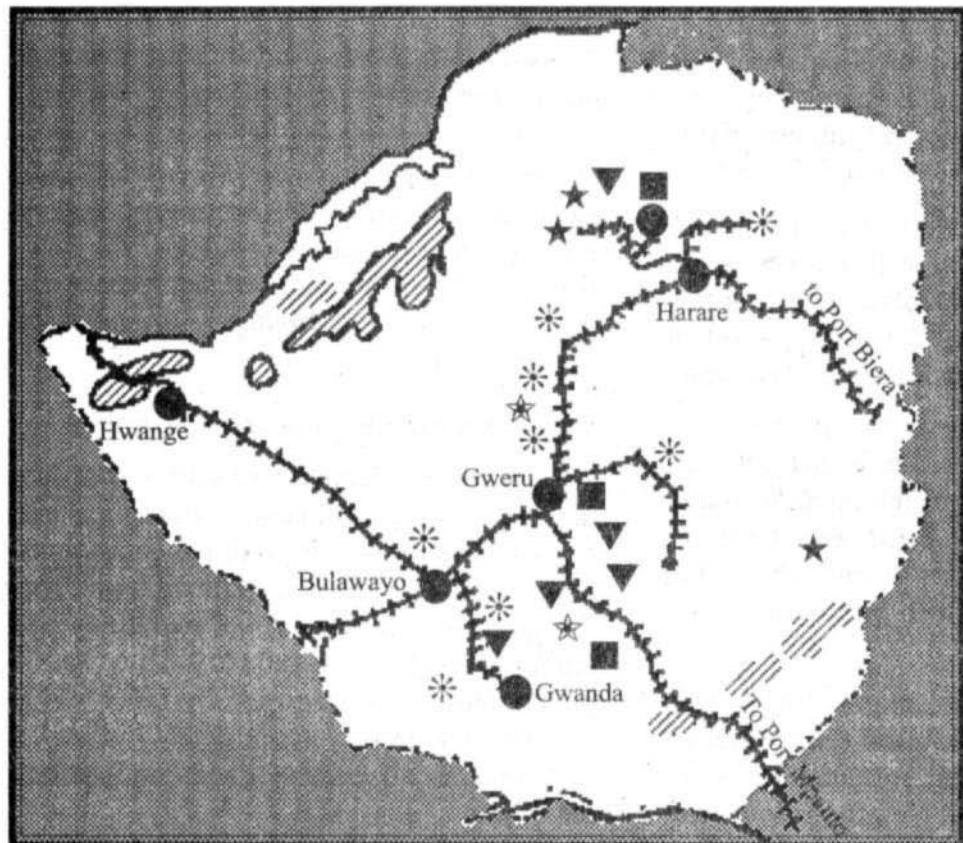
Mining industries are set up after first making a study to discover where mineral deposits are located in high concentrations. A company then takes the site on lease from the government and brings machines and labourers to set up the industry. Minerals are mined and then transported by rail route to the place where they are purified. Following this, several varieties of goods and articles are produced.

This process took place in Zimbabwe too. The companies of Britain, the United States of America and South Africa established mining industries. In these mines, mostly local people work as labourers. These labourers settle around the mines and settlements come up. But if the minerals get exhausted or if the mines are closed due to losses, the labourers have to go to another place to find work.

Most of the minerals of Zimbabwe are exported to foreign countries. The minerals are transported by rail to the ports. However, no part of Zimbabwe touches the sea. Hence the products of Zimbabwe have to pass through other countries to reach sea ports.

- *Look at Map 3 on the following page.*
- *Find out which neighbouring countries can give Zimbabwe access to sea ports?*
- *Which ports are connected by railway lines?*

**Map 3. Zimbabwe
Rail - routes and
Minerals**



Index

★	Gemstone
*	Gold
★	Copper
▼	Asbestos
■	Chrome
▨	Coal

Minerals of Zimbabwe

- In Map 3 locate the regions where different minerals are mined in Zimbabwe*

Unlike South Africa, Zimbabwe does not have large deposits of diamond and gold, although there are a few gold mines. Gold has been mined there since very ancient times but coal, copper, nickel, iron ore, chrome and asbestos were first mined by the British after they settled there.

Cities of Zimbabwe

After the arrival of the English, many cities slowly came into existence. Some of the important cities are Harare, Umtali and Bulawayo.

- See the location of these cities in the map. Are they on rail routes?*

Cities like Harare have emerged as major trading and production centres. They cater to the requirements of the nearby regions as they

have important government offices, colleges, hospitals, etc. Agricultural products like tobacco, maize, groundnut and cotton are brought here to be sold. These are processed here and even exported to other countries. The cities have a large number of flour mills, biscuit factories, oil extraction plants, cigarette factories, etc. Similarly dairy products like milk, butter, cheese and meat are processed here and canned for sale in distant countries.

- Which raw materials for the following industries come from the agricultural regions surrounding Harare? Complete the table:*

Industries	Raw material
a. Packing of meat	
b. Flour mills	
c. Biscuit making	
d. Extraction of oil	
e. Cigarettes making	
f. Leather goods	

One day Ian and Mary were roaming around in Harare when they saw sacks filled with tobacco leaves being auctioned. They asked a person who was standing nearby whether that much tobacco was consumed in Zimbabwe itself.", "No, most of it is exported to foreign countries," he replied. "Now my country exports many things to countries of Africa, Europe and America, and in return imports goods that we need," he added proudly.

Gradually, industries are being set up in Zimbabwe to meet the demand for iron, steel, textiles, etc. Soon, this country will no longer be dependent for these products on other countries.

Ian and Mary were enjoying their stay in Zimbabwe, but their holidays were coming to an end, and their parents too had to report back to work. They boarded an airplane and flew back to Britain.

Exports	Obtained From			Imports	Obtained From		
	Agric.	Mines	Industry		Agric.	Mines	Industry
Tobacco				Machines			
Cotton				Railway			
Maize				Trucks, Cars			
Sugar				Mineral Oil			
Meat				Textiles			
Copper				Chemicals			
Gold				Steel			
Chrome				Pesticides			
Garments				Medicines			
Nickel							
Electrical appliances							

- Tick (✓) the correct columns in the above table and find out if Zimbabwe imports more goods obtained from agriculture or industry or mining. Likewise, find out if Zimbabwe exports more goods obtained from agriculture, industry or mining.*

USES OF SOME MINERALS

Copper: Copper is used not only for making utensils, but also for electrical goods. Tin is added to copper to make bronze. You might have seen brass utensils in your home. Have you wondered how brass is made? Brass is an alloy of copper, tin, chrome, aluminium, etc.

Chrome: Chrome is a whitish metal like stainless steel. You must have seen stainless steel utensils in your home. Stainless steel is an alloy of chrome and iron. Shining cycle handles are also made with the polish of chrome. Zimbabwe is an important producer of this metal.

Asbestos: It is a grey coloured fibrous mineral. It is mixed with cement to manufacture sheets and pipes. You would have seen roofs being made out of these sheets.

EXERCISE

1. Make a list of the countries that surround Zimbabwe.
2. What was the name given to Zimbabwe by the English? Why did they make it a part of their empire?
3. What are the difficulties in animal husbandry in the Low Veld? What kind of animals are mostly found there?
4. What are the facilities for animal husbandry in the High Veld?
5. Why are wild animals now kept in sanctuaries?
6. What methods did the British use to spread agriculture in Zimbabwe?
7. Which are the important crops in Zimbabwe? Select from the following:
rice, soyabean, wheat, maize, jute, groundnut, tobacco, cotton.
8. Explain in four sentences the differences between the agricultural practices of the Bantus and those of the British settlers in Zimbabwe.
9. Why are transport networks necessary for mining industries?
10. Why do people settle near mining areas? Do they live there permanently?
11. What are the uses of copper and chrome? Why does Zimbabwe export them?
12. Zimbabwe exports mostly agricultural and mining products and imports manufactured goods from foreign countries. What is the reason for this?